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NEWSPAPER

The Privacy Commission: One Year Later

By Nancy French
Of the CW Staff

NEW YORK – Things aren't as bad as they may seem on the privacy front today, but they could get a lot worse if corrective action isn't taken soon, David Linowes indicated in a recent interview here.

Linowes, chairman of the Privacy Protection Study Commission established by the Privacy Act of 1974, said abuses of personal privacy reported thus far actually have been far fewer than originally expected.

However, he hastened to add, the potential for abuse – especially in computerized systems – is greater than he had ever dreamed.

Reflecting on testimony heard in the year since the commission began studying the privacy problem, Linowes said he believes the private sector should have to meet privacy and security standards for personal data under its care, as federal agencies are now required to do.

"Restrictions would not be catastrophic for private industry," he said. "I think the private sector is resourceful enough to work within these limitations."

Representatives from American Express, *Computerworld* and the Mail Preference Service have told the commission what they are already doing to comply with the wishes of subscribers who request that they be taken off mailing lists sold for other purposes, he said, but added government-imposed standards are probably not a good solution.

Instead, Linowes favors the concept of "voluntary compliance" as a means of finding out where the problems are – "at least initially."

The idea, as Linowes described it, would be to assign the job of formulating livable regulations to members of private-sector organizations.

"Once [industry members] have written the regulations, they can't object when they are made mandatory," he said.

Linowes believes laws that would cover the private sector's recordkeeping deserve careful consideration for two reasons. First, the private sector is so diverse the same rules may not be appropriate for each of its members and, second, industry maintains a huge volume of records – far more than most government agencies.

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IBM Charges Most Trial Testimony Unneeded

By Edith Holmes
Of the CW Staff

NEW YORK – Almost all of the testimony so far in the U.S. government's antitrust suit against IBM has been unnecessary, IBM attorneys claimed in an out-of-court conference here recently.

Lead IBM attorney Thomas D. Barr previously claimed that between 50% and 75% of the testimony was unnecessary [CW, Feb. 23], but in the recent conference raised that estimate to between 75% and 95% of the testimony in the now 14-month-old trial.

At the same time, Barr urged the judge hearing the case to force the parties to sit down and develop a "better road map" for the trial.

"We have now a situation where it is very difficult for us even to know who the next witnesses are going to be," he said. "We need a better road map, and I think Your Honor has, in that regard, a unique position," he added.

The judge, however, indicated he was reluctant to step into the matter since each side seems to have an emotional reaction to the other side which makes it hard to reach agreements.

Barr said "somewhere between 75% and 95% of all the factual statements made in this case" so far by government witnesses could have been stipulated, or agreed on by the parties in advance of the testimony.

When both sides in a court case stipulate the facts at hand, the court then accepts them as true and witnesses do not have to be called to testify to the truth of the statements.

Often the parties stipulate such things as the date of product announcements, positions held by various people at various times or the price of a product.

These items then do not have to be brought up and discussed with witnesses on both direct and cross-examinations, thereby shortening the time each witness has to spend on the stand and shortening the time the court has to spend to hear the case.

Few Stipulations So Far

The stipulations in this case, however, have been few and far between which has caused the witnesses to spend considerable time in court clarifying details.

To remedy this, Barr urged Judge David N. Edelstein to force the parties to sit down together and agree to facts that are not in dispute.

However, the government refused to comment on the proposal or on the idea of agreeing to more stipulations with the ultimate goal of shortening the trial.

This continuing silience on the part of the government is indicative of the breadth of the "philosophical or policy

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With Dual Systems Aboard Viking

Mission Sends DP 'Out of This World'

By John P. Hebert
Of the CW Staff

PASADENA, Calif. – Computers are taking the lion's share of the burden in providing this country with its first direct experience with a very close neighbor – the planet Mars.

Scientists at the National Aeronautic and Space Administration's (Nasa) Jet Propulsion Laborary (JPL) here and Langley Research Center have been making a concerted effort to locate a new landing site for the Viking 1 spacecraft after the prime Chryse landing site was scrubbed a few days before the nation's Bicentennial celebration.

Sometime in the near future, General Electric Co. computers aboard the orbiter ship portion of the Viking craft will engage in a five-hour checkout procedure, turning on and off the active components on the Viking lander, according to Phil Cuddihy, lander system engineer with the Langley Research Center.

After the procedure has been completed and the working order of lander components verified, the data will be transmitted back to Nasa at a speed of 4,000- or 8,000 bit/sec, Cuddihy said.

If all goes well within the 25 hours preceding the separation of the orbiter ship and the lander, the lander will begin its descent, guided by dual Honeywell computers.

The dual computers in each Viking ship are playing no small part in the mission. "Computers are the brains of the lander and the orbiter and, without them, the mission would be dead," Cuddihy said.

Because of their importance, Nasa has installed redundant computers in both ships. If there was only one computer in a craft and it was lost, the mission would also be lost, Cuddihy said, adding he does not expect to lose any of the machines.

The computers in the orbiter, or the command and control sequencer (CCS), have a 4K-word memory and were used to initially move the ship into an orbit around the planet and to "trim" the orbit to Nasa's exacting specifications once there, he said.

The lander's computers – or the guidance control and sequencing computers (GCSC) – however, are the real stars. They will handle all of the sequencing necessary to guide the ship from separation to landing on the planet's surface and will handle all sequencing of data gathering and data communications once there.

Related stories on the Viking mission on Pages 4 and 6.

Computers on the lander are virtually identical and have 18K words of random-access memory in 25-bit words. "They're actually 24-bit words, with one bit for a parity check," Cuddihy explained. Each computer "block" weighs about 25 pounds, he added.

The Honeywell machine is a derivative of one of that manufacturer's product designs that was adapted and built for the Viking mission, he noted.

The lander will be entirely guided and controlled by the GCSC aboard the craft without intervention from earth-based operations once it has begun its descent.

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Reform Act Seen Cramping Style Of Interstate Network Users

By Ronald A. Frank
Of the CW Staff

NEW YORK – Passage of the Consumer Communications Reform Act would make it very difficult for users to operate interstate communications networks, according to regulatory experts here recently.

Under one of the principles of the proposed legislation, state regulatory commissions would have exclusive jurisdiction over computer terminal and other non-carrier equipment that now can be interconnected to the telephone network.

With state control, "many different standards for interconnection and interconnection policy" would result, and some states "may bar interconnection entirely," according to Herbert E. Marks, counsel for the Independent Data Communications Manufacturers Association (IDCMA).

Speaking at a recent meeting of the Association of Data Communications Users, Marks said this portion of the Reform Act "actually reflects a policy designed to foster the fragmentation of an integrated national telephone network."

Such a fragmentation would be "directly contrary" to previous positions taken by AT&T concerning the importance of having a single unified telephone system to best serve customers, he said.

"Even AT&T recognizes the need for uniform standards for the nationwide telephone network. Fragmentation cannot achieve such a goal," Marks said.

Turning to the effect of the proposed

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Up to 95% of Testimony Unneeded: IBM

(Continued from Page 1)

differences" between the legal teams to which Barr alluded in his remarks on stipulations, one observer said.

Completely in favor of "a more direct way, a common ground" to get at the facts, Edelstein suggested everyone involved in the trial "is a hostage.

"Now, why don't we start thinking in solid terms about bringing some proportions to this case?" he said.

Barr's remarks followed Edelstein's comments that, to the extent possible, he would have each side lay out as specifically as possible just what testimony it plans to present.

Encouraging the district court judge to take "what might be the most unique opportunity that any federal judge may ever have or will have for a very long time," Barr stated he would welcome the court's intervention to require the government and then IBM to spell out what would be offered as evidence.

Edelstein could get the parties started on this road, Barr stated, suggesting the judge is the only one capable of facilitating agreement between the government and IBM at this point.

"You put our heads together at a table and you make us agree, in the sense of saying, 'I can not understand why you refuse to stipulate this fact. It is true or it isn't true.'

"I sit here every day and think, 'My Lord, you know, most of that stuff is easy,' " Barr said, referring to the testimony over the last 14 months from only one-third of the government's scheduled witnesses.

Barr cautioned that he did not mean to suggest stipulations are easy or that such agreements can be reached in a couple of days. But recalling his experience in Telex vs. IBM, he reinforced his belief that such an effort can be worthwhile.

"Lead counsel and I spent days sitting across the table from each other stipulating facts until we went pretty kooky over sitting there and looking at each other," Barr said. But their efforts did reduce the time of the Telex trial to 25 days, he added.

"I think stipulations could replace trial days on the order of one day of stipulation for 10 or more days of trial, maybe 20 days of trial," he told the court.

After over 150 days of trial, Barr suggested no one would have very much to lose by spending two weeks or more to try to agree to a number of areas.

Emotional Factor Strong

While he agreed with the substance of Barr's comments, Edelstein said he had tried to bring about accord between the parties only to become "embroiled in your personal emotional reactions."

He stated he couldn't do more than encourage the attorneys to use "the long experience you have had together as adversaries to bring about a mood of cooperation. Let's get at facts that are really quickly ascertainable," Edelstein said, adding he had heard himself say that "ad nauseum."

But "I can't do any more," he continued. "I can't plant myself in your office; I can't plant myself in the middle of your conferences."

Edelstein referred to "the great stake" he has in this case, "the enormous consequences" the time it involves has for him. "As you know – it is no secret – I could have retired last year," he said.

"We are all going to get very much older if we don't find a way of shortening this," the judge said, suggesting that, at the case's current rate, those who are young now will be old when a final decision is reached.

Can the case be shortened through stipulation and agreement? "Nothing is impossible," the judge remarked that day in court, "but things are not quite as possible when we are living in an armed camp."

Act to Impact Interstate Nets

(Continued from Page 1)

legislation on existing independent equipment available to users, Marks said many of the independent suppliers would be forced to change their business or go out of business.

Decreased research and product development will follow because the telephone companies "will not have any incentive to provide the full range of devices that are necessary . . . for computer systems," he said.

The phone industry does not have a full line of computer communications equipment, and the "record deomonstrates that many of the recent advances in such equipment have been the direct result of competition," Marks said.

Funds paid out by AT&T to support its legislative efforts came under fire recently at another meeting when John Guttenburg, vice-president of Data Transmission Co. (Datran), revealed that in 1975 Bell paid out $39,527,095 in advertising.

Speaking at a recent debate on the Reform Act in Cleveland, Guttenburg, representing the Ad Hoc Committee for Competitive Communications, said these advertising funds were taken from phone bills paid by many customers of the Bell System [CW, July 5].

Much of Bell's current promotional material is designed to solicit support for the Reform Act from both legislators and the public, although exact numbers are hard to define.

Bell's profits have continued to rise with earnings for the second quarter jumping 14.4% over the comparable period of last year. With this type of financial picture, it is doubtful Bell is cutting back on its advertising expenditures.

In 1975 AT&T paid $220,780,876 in consulting fees, Guttenburg said. Among these expenditures was $63,916.32 to Professor Eugene V. Rostow of Yale University who was paid to produce a policy paper supporting the proposed legislation.

Rostow's supporting analysis was among the documents sent by AT&T to stockholders and employees.

This article is one in a series describing various aspects of the Consumer Communications Reform Act of 1976, now pending in both houses of Congress.

To inform members of Congress and others interested in the proposed legislation, both the Federal Communications Commission (FCC) and the White House Office of Telecommunications Policy (OTP) have issued position papers.

"Enactment of the proposed legislation would disserve the public interest by limiting important consumer rights," the FCC said.

In a preliminary report on the effects of competition, the FCC said "competition in the private line and terminal equipment [areas] has had no discernible effect on the revenues and earnings of the telephone industry, nor on the rates for basic telephone service."

There is no valid reason for concluding this situation is likely to change within the next three to five years, the FCC report said.

The proposed legislation would result in the "virtually complete monopolization of an industry in which historical, technological, and economic considerations suggest . . . free market forces are quite capable of serving the best interests of the public," OTP said.

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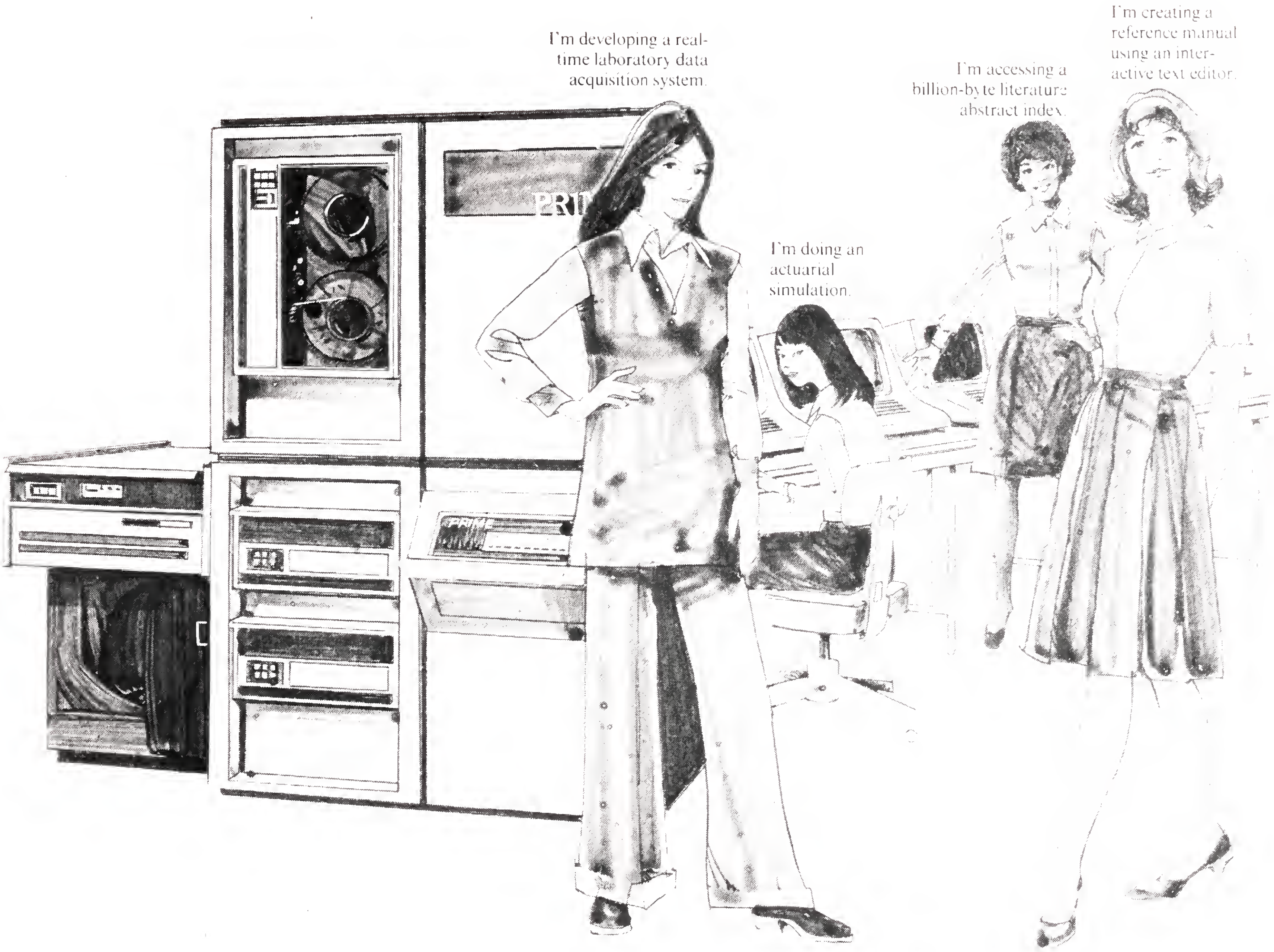
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Aids Study of Viking Data, Pictures

Package Has Celestial Purpose in Martian Mission

By Don Leavitt
Of the CW Staff

PASADENA, Calif. – A software package used by many installations has been combined with technology not available to most to help technicians at Jet Propulsion Laboratory here study the data and pictures being sent back from Mars by the Viking I spacecraft.

While control of Viking and the capture of transmissions from it require rather exotic communication systems [CW, July 5], Mark IV from Informatics manages the final link between the pictures and the analysts who want to use them, according to Dr. Edward Y.S. Lee.

The whole process begins when still pictures are taken line-by-line by a pair of TV-like cameras and stored in digitized form with identifying information on magnetic tape aboard the spacecraft, he explained. The data added to the picture itself tells which camera took the picture, when and where.

The earth-bound transmissions include data about conditions aboard Viking itself and "a certain level of 'noise' " resulting from the distances involved, as well as the pictures, Lee said.

The first level of processing eventually filters out all the undesired material and recreates, when necessary, whole lines of a picture that may have been lost in transmission.

Handled largely with "quite sophisticated" Fortran programs, the first-order processing will become more complicated later this summer when Viking II, already on its way to Mars, adds its stream of data and pictures – again from a pair of cameras: one on the orbiter portion; one on the lander unit of the spacecraft – to the traffic now coming in from Viking I.

'Massaging' Pictures

Second-order processing involves "massaging" the pictures as received; enlarging "interesting" portions, rotating the views to gain new perspectives and enhancing the images through various techniques. This work is the responsibility of the Image Processing Laboratory where Lee works.

Equipment there includes an IBM 360/65 with 1M-byte of core, eight IBM 3330-equivalent disk spindles and seven tape drives operating under OS/MVT with Hasp and Time-Sharing Option (TSO). A Digital Equipment Corp. PDP-11 is used as a front-end interface to many display TV monitors and "various" interactive, on-line terminals, Lee said.

While the lab has a range of application programs and software tools to work with batch-mode image processing jobs, it uses Mark IV/Model 260 Version 5.0, several special options and some in-house innovations to manage on-line accessing of the picture catalog data base by the non-DP-oriented technicians.

The picture catalog is very similar to a card catalog in a library, according to Lee. Each entry corresponds to an image taken on Mars, he explained, but there are many more items of information than in a card catalog.

Thanks to the second-order processing, one picture may have many versions, a processing history record and many forms of output, each stored in a specific place.

These may include digital copies stored on disk to be displayed at a TV monitor, a file "written out" on a reel of magnetic tape, a hard-copy photograph or a negative, Lee said.

To keep track of the interrelationships, the picture catalog has been organized as a hierarchical file structure. Lee expects this to grow "almost exponentially" as the mission continues. The number of basic images will increase and so will the number of versions of each as the technicians study them more closely, he said.

The technicians' requests might be as general as asking for a listing of all pictures dealing with a part of the Mars surface – the proposed Viking landing site, for example – or as specific as all pictures of an area taken when the sun was directly overhead. The identifying data added to each picture as it was made or as its image was later processed would provide the means of meeting such requests, Lee said.

To support on-line use of the picture catalog, Lee's team first recognized several phases or components that make up any on-line user request. Then they built a system to cope with the requests, based largely on the capabilities of Mark IV's On-line Query Language (OQL) and On-line Executive (OLX).

Novice User Requests

They reasoned that users familiar with TSO and working with keyboards could manage their own requests, but that others clearly needed help to reach the data they wanted. Instead of forcing these occasional users to fully program their requests, the Data Library Team developed a series of Command Lists (Clist) which required only the naming of parameters before being used.

For continuity between experienced and novice users, the team decided the Clist syntax should be very similar to TSO and conventional Mark IV commands; they should cover all phases of an on-line request receipt and response; and they should be easy to invoke.

Also recognizing the need to interface with other application programs, the team developed more than a dozen Clists, including "at least one" for each phase of an on-line request and several combinations so various phases could be run consecutively.

They also determined several ways to implement the Clists as implicit commands which could be invoked without using the TSO EXEC command.

As simple as use of the Clists seemed to be, Lee's team still realized some of the technicians would need occasional clarification on a specific point. User documentation, developed concurrently with the Clists, was formatted as a HELP data set partitioned under TSO which could be evoked from any user terminal.

This approach also provided a means of keeping all users posted whenever changes are made in any of the Clists.

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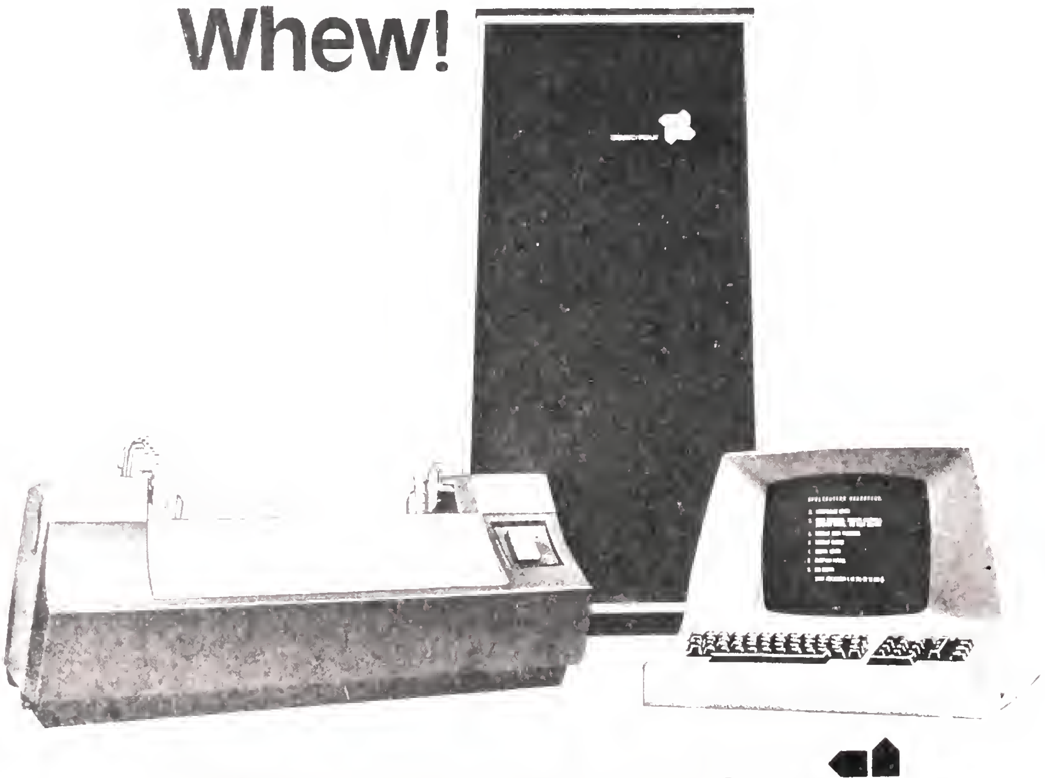

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Models Readied to Help Interpret Data Sent by Viking

CAMBRIDGE, Mass. – Two MIT researchers here have prepared computer models of the interior of the planet Mars to facilitate the interpretation of data that will be sent from the two Viking spacecraft slated to land on the planet.

While the bulk of the experiments on the two Viking craft, one of which should touch down later this month and the other in September, are devoted to detecting the presence of life on the planet, each spacecraft will carry a seismometer to detect "Marsquakes" and to help determine the structure of the Martian interior.

The computer models of the planet's interior were prepared by Prof. M. Nafi Toksoz and David H. Johnston, a graduate student, in MIT's Department of Earth and Planetary Sciences.

The models were developed on an IBM 370/165 at the school. The main computer effort required to work on intricate mathematical computations – supports a very detailed model which takes a full 10 or so minutes of machine time to compute, Toksoz said.

The modeling predicted the structure of the interior and the size and composition of the core and mineral assemblages of the Martian mantle. The researchers found that Mars is similar to the earth in many respects, but that it differs from the moon.

Data from the previous Mariner obiters, including observations of Mars' gravitational field, its shape and topography and photographs made of the surface, provided the basis for the models.

Toksoz and Johnson calculated the changes of density with depth in the planet. From these models, they concluded that, like the earth, Mars has a large, 1,250 mile radius molten core, but that this core is less dense than the earth's.

The most useful information for the interpretation of the data obtained from the Viking seismometers will be found by using the density models to calculate the velocities of seismic waves in Mars that might be generated by Marsquakes, Toksoz said.

Toksoz and Johnston predicted Marsquakes will occur and will be more prevalent and energetic than quakes detected on the moon. The seismic activity in a planet is a good indicator of its internal temperature, energy and tectonic rigor. Viking seismometers will give a good measure of this; they will also enable the seismologists to determine the size of the Martian core and structure of its mantle and crust.

The interpretation of such data in terms of the theoretical models will help to define more closely the internal state of Mars and its comparison with the earth and moon. Ultimately this will enable scientists to place the earth, moon and Mars in proper context in the solar system with regard to the formation and evolution of the planets, the team said.

DP Goes 'Out of This World'

(Continued from Page 1)

Cuddihy said. This is because radio transmissions take a full 18 minutes to reach either destination – which will be about 201 million miles apart on the touchdown date later this month.

Once on the surface of Mars, the computers will issue commands for the execution of the organic analysis experiments and the taking of individual and stereoscopic pictures, among other functions, Cuddihy said.

During these operational sequences, the machines will keep the lander's transmitter in constant orientation toward the orbiting ship and send the accumulated data to ultrahigh frequency (UHF) receivers there at a rate of 16 kbit/sec, Cuddihy said.

By the third day on Martian soil, scientists back on earth may decide they have enough initial information and will be able to update and reprogram the computers to perform additional functions.

The landing site change posed only minor problems to the orbiting craft and the lander. Nasa engineers reprogrammed the lander computers to separate from the orbiter at a different time during the closest point, or periapsis, the ships would pass by Mars' surface – a distance of about 930 miles, Cuddihy said.

The sophistication of the mainframes aboard the lander is marked by their ability to shut down if there is a power failure and come back up when the failure is over and their ability to carry out a sequence of emergency procedures in the event of computer failure after landing, Cuddihy said.

In the latter case, the device will send out a data sequence once every minute over the orbiter relay station and back to earth to tell where the computer failure is located, he explained.

In the JPL Space Flight Operations Facility control center, six large CPUs and associated systems will have an integral part in collecting and analyzing the incoming data.

For the most part, three IBM 360/75s will handle data from the lander, including real-time command telemmetry processing, batch processing and project development data processing, respectively.

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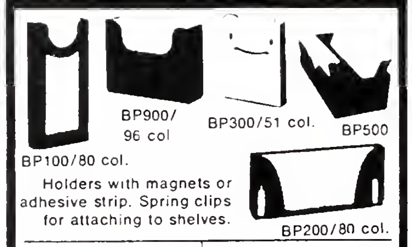
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Shutdown of Three Vendors' Operations Not Daunting Faith in Future of POS

By Toni Wiseman
Of the CW Staff

Retailers and supermarket operators seem to be caught in a whirlpool which has dragged three vendors under in the recent past.

The point-of-sale (POS) operations of MSI Data Corp., Singer and Bunker Ramo already succumbed to the deep; how many more will follow? Is there indeed a "drowning" trend? What do recent events portend for POS?

There are two main points of agreement among retailers, vendors, consultants and industry experts: first, that POS is here to stay and, secondly, that NCR and IBM are the only two "giants" who are going to stay afloat.

"POS is still the way to go," Jim Quigley believes. Quigley is the DP manager for Hess' in Allentown, Pa., a store which currently has 450 Singer terminals and seven Singer System Tens.

Quigley thinks it is "sad" that Singer is leaving the industry because it "has excellent systems," but he doesn't think the industry is going to fold as a result.

"What this means is that there will probably only be IBM and NCR left, which will not give users the selection they should have," he stated.

Short on Sympathy

The National Consumer's League, headquartered in Washington, D.C., is short on sympathy for the floundering hardware companies. "They should have test marketed before they went into [the POS market] and they would have known what to expect," a spokeswoman said.

"Modernization isn't always the best thing," she remarked, but added she does feel sorry for the computer vendors' employees losing their jobs because of the closings.

Len Farano, executive vice-president of Gambit Management Strategies, feels the POS market per se – the sale of terminals – is a marginal market in the sense that it is hard to make a lot of money just selling terminals.

"The payoff will come if you have a tie-in sale for the terminals – in other words, a mainframe. And at the present time only two POS vendors, NCR and IBM, have that tie-in," he said.

"Singer, for instance, didn't. It had a great customer base in terms of terminals, but didn't sell CPUs bigger than System Tens, which is not a big money market.

"IBM, on the other hand, doesn't work without a 370, which is a clever marketing approach. Everyone said, 'How terrible to force a retailer into buying the mainframe,' but if you notice, IBM is still in the marketplace," Farano stated.

Three years ago Gambit predicted the total POS market could not support more than two major vendors, plus a couple of "dwarfs," Farano recalled. Today, it is sure NCR will be one of the major suppliers.

Unitote/Regitel still has a hard row to hoe, but has been successful so far, and Sweda has good gear but its marketing approach has vacillated too often in the past to really make any conclusions, Farano stated in a snapshot view of the market.

Two Ways to Revamp

Two things could revamp the POS market, Farano said.

"Vendors could sell cheaper terminals and supply a total system," he said. They might not even sell the retailer terminals, but rather provide a service with terminals hooked into a service bureau, he suggested.

"Or, for the $5 to $15 million retailer, they could still sell terminals, but lower the back-end cost by supplying him with an in-house mini," he said.

Service Bureau Corp. (SBC) seems to agree with this philosophy because it recently acquired CRI Data Services, Inc., a New York-based data management service for retailers.

While SBC declined to comment on its views of future trends, a company spokesman noted it "got into the business because we saw a need for a data service organization geared to the needs of retailers. And with our network across the nation, we thought it would be a natural."

While SBC currently only polls terminals or processes information sent to the service bureau, the spokesman said terminal rentals were not out of the question in the future.

More than one industry source said the future of SBC looks bright, or "water-tight," particularly since it is picking up many Andracor customers, a retail service bureau arm of Boeing Computer Services which has not kept its head financially above the corporate watermark, according to sources.

Irving Solomon, vice-president of the National Retail Merchants Association's (NRMA) Information Systems Division, feels consumers and unions have turned food retailers away from POS and, as a result, vendors are taking each order and making it a special order.

Retail stores, however, will keep on ordering equipment, particularly as the mechanical registers become obsolete, such as the NCR 52s which are now 10 years old, he said.

The NCR 250 and 255 series and the Sweda 800 series will be popular among small store operators since they can be used as bookkeeping devices as well as cash registers, he said.

"The POS market is still open," Solomon said. "There are over 170 stores now being polled or sending in cassettes for processing, and that number is growing."

Like others before him, Solomon said he is sorry about Singer, but added more than 80 stores with Singer equipment have called and reported they want to order more terminals before Singer discontinues production.

NCR is also doing well, he noted, and IBM has more orders than it can handle productionwise.

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Privacy Unit Head Sees 'Undreamt of' Abuse Potential

(Continued from Page 1)

The Reuben H. Donnelley Corp., for example, a firm that provides marketing services such as sales promotion campaigns for manufacturers, maintains as many as 100 million personal records, Linowes said.

By comparison, the Internal Revenue Service, one of the largest recordkeeping agencies in the Federal government, maintains only about 70 million records.

"Three-fourths of those who testified said they believe the information they keep is safe," but many were startled when he asked who would be controlling their companies and thus their information -- tomorrow, Linowes recalled.

In posing the question, Linowes said, he was thinking about the foriegn interests who are buying American and Western European companies.

Furthermore, "we also know that organized crime has some very interesting fronts," he said, noting that if information is power, as everyone says it is, "I think we can expect subversion and organized crime to get into the information business before long, too."

Linowes refused to elaborate further for quotation on this chilling prospect.

Linowes called the privacy violations allegedly committed by 56 insurance companies named by a federal and grand jury in Denver [CW, June 28] "the most serious indictment against any industry to date.

"Insurance industy representatives who testified at our Los Angles hearings at the same time the Denver district attorney appeared claimed not to know anything about it," Linowes said.

"We don't know how high up in the industry this thing goes, but we do know that clerks don't have the authority to hire attorneys and private investigators," he added.

CW Photo by N. French

David Linowes

William O. Bailey, president of Aetna Life and Casualty Co., who also serves on the commission, "wasn't there to hear it," Linowes said.

Because computers can do so much so fast, Linowes places them at the source of privacy abuse. "Already they are being used to identify any kind of special interest group you could want – from inquisitive kids to affluent Catholic professionals to fat cats for political contributions. And new applications are being dreamed up every day.

"Even so, computers are only being used at 10% of their capacity," he said.

Computers have changed the face of social science research, he said, adding the commission has felt strong resistance from academic and medical researchers who don't want their access to personal records limited.

For these reasons, the privacy problem "will have to be monitored by Congress long after the commission is disbanded," he said.

Commission's Accomplishments

As for the commission's accomplishments to date, Linowes said, "For one thing we've laid to rest many of the fears expressed about use of the Social Security number as a universal identifier" after it was learned the private sector hardly uses it at all.

He also cited completion of the commission's investigation and publication of recommendations on curbing the Internal Revenue Service's use of personal information. Its recommendations on mailing lists will be published soon, he added.

Still to be heard by the commission are representatives of the credit reporting industry, "the central nerve center of the information industry," according to Linowes.

As for the question of who actually owns personal data – the data subject or the organization that maintains it – Linowes was evasive.

"We're leaning toward recognizing individuals' claims to such information, and the opinion of every vested interest in the nation is being heard before we make that decision," he said.

Whatever the commission decides, those decisions will still have to go through another crucible – the U.S. Congress – before anything comes of them.

Although Linowes indicated his position as a partner in the New York accounting firm of Laventhol, Krekstein, Horwath and Horwath gives him access to the good life, he denied having any bias toward business.

"But business executives are Americans, too," he said, "and by virtue of their privileged position in society, they actually enjoy more benefits provided by the Constitution and our form of government than the ordinary citizen.

"If the right to privacy is lost in this country, they have far more to lose, and I think they realize that," he said.

In his own defense, Linowes pointed out President Ford had no reason to select him to serve on the commission: "I've been an active Democrat all my life, and I think my record speaks for itself."

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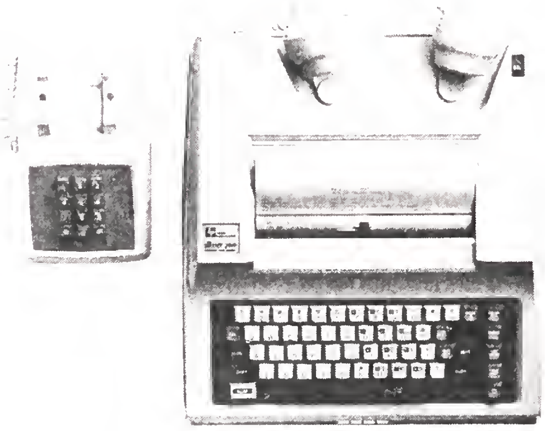

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ABA Head Calls EFT Inescapable Reality for Banks

OSAGE BEACH, Mo. – Each and every bank in the U.S. has entered the world of electronic funds transfer (EFT) or will soon do so. No banker can realistically say, "Count me out," and a prime example of this is the direct deposit of Social Security checks, according to J. Rex Duwe, president of the American Bankers Association (ABA).

"The government is cutting the costs of processing and delivering recurring Social Security and Supplemental Security checks by using an electronic process – namely automated clearinghouses," Duwe told a recent Missouri Bankers Association meeting here.

In a review of EFT news, Duwe discussed the issue of customer-bank communication terminals (CBCTs), predicting the whole question of whether they are to be considered bank branches will eventually wind up in the Supreme Court.

But, he said, the decision on CBCTs should not be whether EFT facilities are branches. Instead, the law should be defined by a debate on EFT, not a debate on what "branch" means.

ABA's position is that CBCTs are new devices for delivering traditional services – not in changing those services – and that they should be allowed, Duwe stated.

"Bank branching laws, by definition, only affect banks. If we alone are blocked from installing electronic terminals, our competitors would gain an unfair advantage," he said.

"CBCT rulings don't affect thrifts and they certainly don't affect Penney's, Sears and Montgomery Ward.

"But these retailers are our financial competitors too. Right now, they are offering a tremendous amount of credit to our mutual customers.

"These retail outlets are installing computerized cash registers that could easily be used to accept the equivalent of deposits," Duwe stated.

Privacy Commission Sets Hearings On Health Care Providers' Records

WASHINGTON, D.C. – The Privacy Protection Study Commission will hold hearings on the recordkeeping practices of federal agencies involved in health care services and health research July 20-21 in Room 2358 of the Rayburn House Office Building here.

The hearings will supplement the commission's inquiry into the recordkeeping practices of private-sector health care providers held last month in Los Angeles.

The commission will concentrate on development and use of medical records by federal health care providers and institutions such as the Public Health Service, Veterans Administration and the Defense Department.

Allied users of medical records such as utilization review programs, biomedical and health services research and peer review organizations will also be examined.

The commission is especially interested in examining the conditions under which records have been disclosed to other health care providers, institutions and third parties, a spokesman said, and will explore the procedures which permit an individual to access and review his records.

Individuals who wish to submit their views or testify can contact the commission's director in writing at Suite 424, 2120 L Street N.W., Washington, D.C. 20506.

DP Exhibit on View For Boston Visitors

BOSTON – When tourists' feet begin to ache from tramping the Freedom Trail here this summer, they can recuperate at a computer exhibit at the Boston Museum of Science.

The focal point of the $350,000 exhibit is a Honeywell 316 minicomputer connected to seven video-display terminals which can be operated by visitors.

The terminals allow visitors to play games, make math calculations and retrieve information about the museum, such as available guided tours, the restaurant menu and a message from the director.

There are also six supplementary exhibits to help visitors understand how the computer works, its place in the history of information processing and its present and future uses.

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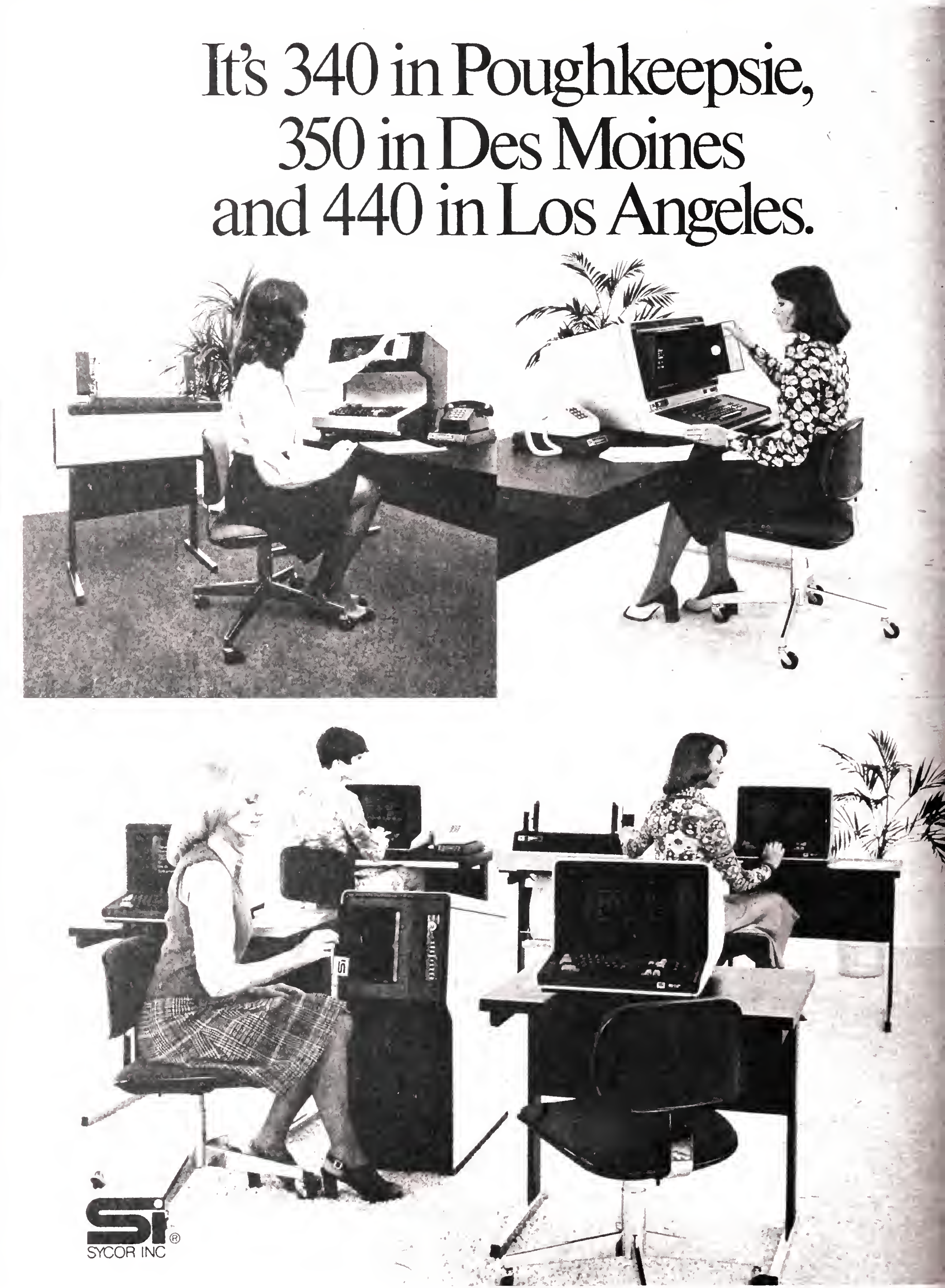

To Administer, Enforce Law

Control Board Included in Privacy Act Passed by Ohio

By Nancy French
Of the CW Staff

COLUMBUS, Ohio – This state has become the sixth in the nation to enact a law regulating the use of personal information by state and local governments.

But, unlike most other states, this one set up a control board appointed by the governor to enforce and administer the information practices spelled out in the law.

Among its responsibilities, the Ohio Personal Information Control Board, as well as the state's Department of Administrative Services, has been authorized to exempt a personal information system from the law if disclosure of that personal information would not endanger an individual's personal privacy.

The law, effective next Jan. 1, will apply to all state and local agencies, including the state university system. However, law enforcement records and all records considered "confidential" under existing law will be exempt.

The law requires information keepers, upon request and proper identification of any person, to:

- Inform that person of the existence of a file of personal information about him.
- Permit that person or his attorney to inspect the information.
- Inform the person about how the information is used and who is usually granted access to the information.

If a person disputes the accuracy, relevance, timeliness or completeness of the personal information on file, he may ask the agency to investigate the current status of the information.

After investigation, the agency must notify the individual of its findings and the action it plans to take on the disputed information.

The agency must delete any information it cannot verify or finds inaccurate. Following such a deletion, the agency must notify the individual and any person designated by the individual that the deletion has been carried out.

If the individual is not satisfied by the agency's decision, the agency must permit the individual to file a statement that is included in the system of records. The statement may be limited to 100 words providing the agency assists the individual in drafting a clear summary of the dispute, the law said.

That statement must be included with any information subsequently transferred, reported or disseminated. If the agency believes the statement is frivolous or irrelevant, it may file its own statement and include it with all information transfers.

Annual Inspection Only

A person may inspect records of personal information maintained about him by an agency only once per calendar year unless rules adopted by the control board permit more frequent inspection, according to the law.

Psychiatric or psychological information maintained on a person may be disclosed to the person's personal physician, psychiatrist or psychologist or to any attorney who presents a signed, written authorization from the person, but not to the person himself.

As part of their new responsibilities, every state and local agency must file a notice of the existence and character of its personal information systems every January.

Every state and local agency that plans to establish a new personal information system on or after Jan. 1 or substantially enlarge or change one it has must file notice of those plans.

Every state or local agency that maintains a personal information system must appoint one individual to be directly responsible for the system and implement rules for its use that comply with the law.

Employees responsible for operating or maintaining a system must be informed of the law and its provisions. Further, state and local agencies must specify the disciplinary action that will be taken against an individual who violates the law.

When obtaining information from an individual for use in a data file, an agency must inform the individual whether he may refuse to supply the information requested.

The requested information must be necessary and relevant to the functions that the agency performs by statute, ordinance, code or rule, the law said.

When information in a system is no longer timely, the law requires elimination of the data.

The Department of Administrative Services and the control

Continued on Page 12

Now there's a family of distributed data entry and processing systems that you can tailor to the requirements of your remote sites.

If you've considered the advantages of distributed data entry and processing, you've probably discovered a sad truth:

A system that's fine for Poughkeepsie might be a washout in DesMoines.

Different sites have different needs. From remote data entry, to communications, to remote inquiry and response, to on-site report and forms generation.

And to overwhelm a small branch with high-powered equipment is just as bad as under-equipping a large one.

To match each of your branches with exactly the right equipment, in both hardware and software, there's only one terminal manufacturer to turn to. Us.

We're as flexible as you are.

Using our Sycor Models 340, 350 and 440, and their wide range of peripheral equipment, you can pinpoint capability to site requirements and price.

Our Model 350, for instance, might be just the ticket for your two-man operation in Des Moines. While a larger branch in Los Angeles might require the concurrent background processing capabilities of the Sycor 440.

And, while each of the three terminal systems has its own unique capabilities, they all work together in a remote processing network.

Each, for example, can be programmed with our high-level, easy-to-use TAL language. And, they not only talk to your CPU, but to each other.

And that means flexibility.

Should the requirements of one location change, our systems can change with them. You can switch terminal models without changing programs, or even retraining operators.

The Model 340.

For smaller office situations that call for data entry, you'll find our Model 340 the low-cost intelligent answer.

No matter which of its hundreds of applications you use it for—like order entry, payroll and accounts payable—you're assured of virtually error-free data every time. Because operator errors are pointed out immediately for on-the-spot correction.

And, its 8k bytes of programmable memory and capabilities like customized field validation, conditional data entry and arithmetic operations, mean the Model 340 goes even further in providing for needs you might not even have anticipated when you first got it.

The Model 350.

If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product price and salesman files right at the source.

And, with its 16k bytes of programmable memory, the Model 350 not only retrieves data, but maintains and updates files—and even generates reports.

Just key in a customer number and you get all the pertinent data: name, address and billing information. That means reduced keystrokes, improved accuracy and big savings.

The Sycor 440 System.

When you need more than just data entry, look into our new Sycor 440. With a disk storage capacity of up to 10 million characters and the use of up to eight separate terminals, you can do data entry and inquiry response concurrent with background processing.

Our 440 system lets you share and access files locally, reducing communication line costs and investments in central CPU resources.

Each display is controlled by the on-site processor and is capable of performing independently. At the same time that you're performing data entry you can make use of our special programs to produce a wide variety of management reports like sales analysis, inventory and billing.

It's a system as flexible as your needs.

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We invite you to take a closer look at our family of distributed data entry and processing systems—the lowest cost answer to your branch office needs.

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'Thirty Year Law' Cited as Risky Axiom for DPers

By Toni Wiseman
Of the CW Staff

CHICAGO – "The 'Thirty Year Law' says we tend to mishandle threats which occur less frequently than once in 30 years because 30 years is the limit of an individual's direct experience," Robert Jacobson, vice-president of Chemical Bank, said here recently.

"DP managers have the tendency to say, 'If I've been in DP for 15 years and never seen it happen, I don't believe it ever will happen to me,'" Jacobson told attendees of the 1976 Computer Protection/Insurance seminar cosponsored by the publishers of *Computerworld* and *Business Insurance*.

In the same way, DP managers tend to say that they aren't going to enact a certain security measure because it isn't perfect, he said.

"But no security measure is perfect. The task before us is to reach the point where the cost of security measures balances out against the expected loss reduction," he noted.

The computer environment presents two special problems to the risk manager, Jacobson said. These are the rapid change in technology and the very limited experience available which makes risk evaluation based on past experience very shaky – particularly to the DP industry, which itself spans less than 30 years.

The future offers key technical and operational challenges, he said. For instance, electronic funds transfer (EFT) and point-of-sale systems are introducing a new factor: the electronic interface between parties to a financial transaction.

At the same time, he said, a new technical problem is appearing, that of identifying the person at the far end of a wire. The problem is to know "who you are, not what you have or what you know," he said, comparing EFT verification to a person walking into a bank with a paper bag over his head.

Current planning and operating systems are placing increased emphasis on security, reliability and integrity, Jacobson said. At the same time, however, they are highlighting the need for one-of-a-kind production inspection techniques in terms of technical design standards, operating standards, quality assurance and change controls.

Criminal Population Growing

Another new factor, one affecting computer crime, is the growing population of potential computer criminals and the increasing number of opportunities.

"Today we're training kids in primary school in computer science," Jacobson noted. "There is a fraction of us who are inherently crooks, it's sad but true, and they are getting educated along with the rest of us."

So the problem is now one of better audit and control techniques for "suspicious activity reporting" and better system design, he said.

Finally, he said, there is another new factor introduced by on-line teleprocessing systems – the growing dependence in daily operations on real-time systems which are inherently difficult to back up.

The industry now faces the problem of developing cost-beneficial backup techniques which may include an analysis of costs and penalties of delays, alternate modes of "nearly real-time" operation and alternate/standby hardware and telephone circuits, he said.

Ohio Privacy Act Sets Up Board

(Continued from Page 11)

board must adopt standards for interconnection or combination of personal information systems maintained by more than one agency and adopt rules that provide a means for people to be informed of or trace their personal information when it is combined with that of any other system.

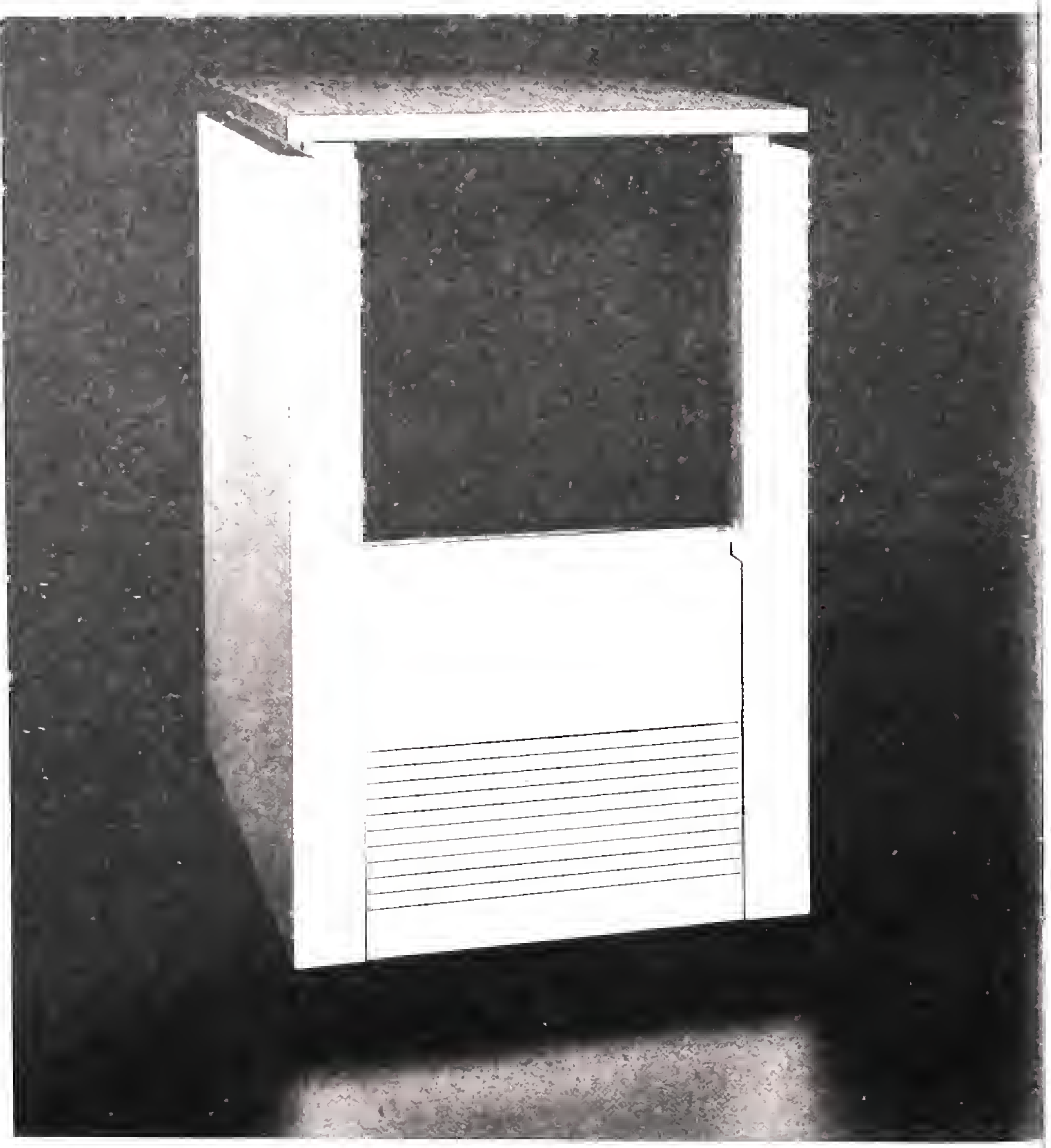
In addition, the Department of Administrative Services and the control board must set up rules authorizing the types of disclosures or uses of personal information by agencies when new programs are developed or when public health, safety or welfare is involved.

They also must set rules that authorize access to personal information in instances beyond those provided for by the privacy act itself.

Further, the two bodies must provide standards for security.

A person harmed by the use or disclosure of personal information relating to him may recover damages in a civil action from any agency which:

- Intentionally maintained personal information known to be inaccurate, irrelevant, no longer timely or incomplete.
- Intentionally used or disclosed personal information in a manner prohibited by the law.
- Supplied to another agency personal information known to be false.
- Intentionally denied a person the right to inspect and dispute personal information when it might have prevented harm.



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A lot of plusses-with one big minus.

Our new 4000-Plus minicomputer-based timesharing systems offer a number of plusses over the highly successful 4000 series:

String arithmetic, logical operators and many other language features now microcoded for faster and more efficient operation.

Magnetic tape software back-up and entry, using a new tape pack for easy handling and mailing.

Storage capacity in our smallest system is tripled—to 7.5 megabytes. And memory expansion (in 7.5 megabyte increments) is about one-third the previous cost.

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A revolutionary self-stacking structure eliminates the conventional system cabinet. All major system components are contained in stackable, interlocking cages. Cosmetic covers and top simply snap on. This radically new approach makes for the easiest system expansion, component replacement, and portability.

And while the new 4000-Plus systems give you these ease-of-use improvements, they still offer the advantages that made the earlier 4000 such a good timesharing system. Like hierarchal access, on-line software mobility, and a wealth of system management features. Like BASIC-X, the user language with the simplicity of BASIC and the sophistication necessary for demanding business and scientific applications. Modular expandability—in port capacity and mass storage. And 24 hours, seven-day-a-week on-line support.

The 4000-Plus series: a lot of plusses.

The one big minus? The Model 4000/15 timesharing system costs $35,950—representing a $20,000 reduction over the previous lowest-cost 4000. The bigger 4000/25 system is available at similar savings.

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With Advent of Telecommunications

Insurance Problems Facing DP Managers Seen Altered

By Toni Wiseman
Of the CW Staff

CHICAGO – The advent of telecommunications has altered the insurance protection problems facing DP managers and risk managers, according to Rees S. Himes, assistant vice-president at Marsh & McLennan, Inc., here.

Some of these problems can only be controlled by security methods, and some are better controlled by insurance or a combination of both, Himes said recently.

The various specialized DP insurance coverages normally sold to policyholders include DP equipment, DP media, valuable papers and records, business interruption, extra expense, errors and omissions, personal liability and crime, he said.

An additional type of insurance should be made available to DP installations – one to cover external loss – Himes told an audience at the 1976 Computer Protection/Insurance seminar cosponsored by the publishers of *Computerworld* and *Business Insurance*.

Current policies afford no coverage for the theft of property or of computer usage by those who are not employees of the company, he said.

Lloyd's of London, however, is working at developing a coverage which will be known as "computer external crime insurance" and will cover policyholders against financial loss arising out of the theft of property such as inventory or against financial loss arising out of theft of computer time, he said.

The purpose of DP equipment insurance is to provide capital for the replacement of equipment damaged by fire, water, earthquake or other hazards not specifically excluded from the policy, Himes said.

The problem is how to determine values so the loss recovery will be adequate, Himes said.

In view of the rapid obsolescence of computers, a policy should pay the cost to replace the damaged equipment with equipment of the same kind and quality, he added.

"This requires that the amount of insurance be declared on that basis and not at original cost," he advised. "It also requires a frequent upgrading of the insured amount to avoid a coinsurance penalty. This is especially true during these times of high inflation."

There is also functional replacement valuation, but it is fairly uncommon, Himes noted.

Under this type of policy if a policyholder feels he would like to upgrade his present equipment, should he have to replace it because of loss, he may do so by declaring the value and nomenclature of the equipment he intends to use following a loss.

Media Coverage

The most commonly purchased insurance is media coverage, yet its purpose and scope are often misunderstood, Himes said.

A user may insure all media for a blanket value, in which case the coverage will replace only the damaged disks, tapes, etc. and pay for the cost of copying data onto the media.

The second way to insure media is to set an agreed value on each disk, reel of tape or punch card. The valuation will then include the cost of media, copying and the cost of research to recapture lost data.

"Valuable papers and records insurance covers problems similar to media insurance except the policy covers data which has not been put into a DP format," Himes said.

The second most commonly purchased coverage is extra-expense insurance which provides the necessary cash to continue operation after a fire or other hazard has disrupted operations.

"Extra-expense insurance is not a substitute for a disaster plan. If alternate methods of continuing operations are not available, operations must cease and an insurance recovery will not be made," Himes added.

Business interruption insurance does not include extra-expense coverage, Himes cautioned the seminar audience. It is designed soley to provide a policyholder with enough money to finance its fixed expenses which continue after a loss and to reimburse the policyholder with a sum equal to any profits which would have been earned had there been no disruption of operations.

Finally, there is errors and omissions liability insurance, a different type of policy entirely.

"Errors and omissions liability insurance protects you from legal suits arising from your negligence with regard to a third party," he said.

Editorials

Dirty Tricks

The dirty tricks allegedly employed by some 56 insurance companies to illegally obtain individuals' medical records [CW, June 28] are outrageous, but somehow not surprising to those who have been following the privacy issue for many years.

The practice of obtaining medical records without authorization for use in forcing settlement of insurance claims in a manner that benefits the insurance company has been going on for at least 25 years, according to Denver District Attorney Dale Tooley.

For the 56 firms named to date, disclosure of this illegal activity and the subsequent indictments are overdue.

Since no federal or Colorado law is in effect at this time to protect personal information maintained by hospitals, doctors and insurance companies, the grand jury was forced to charge conspiracy, impersonation and theft of trade secrets. Proving these charges may be a difficult task for the district attorney who must face the big guns of the insurance industry in court.

While no privacy law will guarantee citizens protection against subversive activity of the kind alleged here, such a law might be a deterrent if penalties for violations carry a higher cost than settling insurance claims honestly.

Further, a well-thought-out privacy law would make recordkeeping employees who provide personal information over the telephone without ascertaining the true identity of the caller as guilty as those who are actually subverting the system.

The work of the Denver district attorney in smoking out these abusers of personal privacy should be applauded.

Hopefully these indictments will be considered by the congressmen who must draft a privacy law to protect individuals against abuses from the private sector when the subject is considered again next year.

Unconvinced Consumers

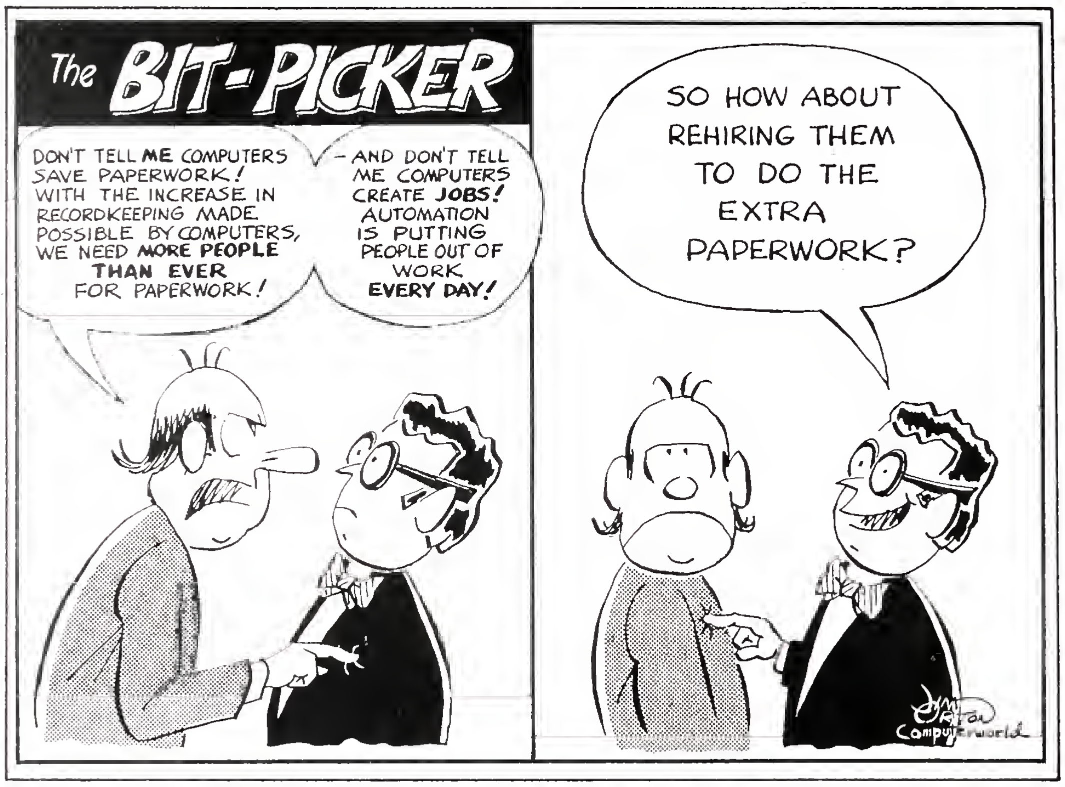
Consumer representatives from various sections of the country gathered recently in Cleveland to hear the telephone industry explain the Consumer Communications Reform Act of 1976 [CW, July 5].

The consumers were anxious to hear how they would be affected by competition fostered by recent Federal Communications Commission (FCC) decisions. Despite dire warnings about possible increases of up to 75% in residential phone bills which could not be substantiated with statistics, the consumers were not convinced the battle over specialized carriers and interconnection had any real impact on them.

There is a serious message far beyond this one meeting which failed to convince consumers. Many members of Congress have chosen to support the proposed legislation because they were led to believe it had a direct effect on the telephone bill of the voters back home.

It may well be the Consumer Communications Reform Act is really concerned with intra-industry problems that should be discussed and decided by the FCC. The Communications Act was created to set up a commission that would unburden Congress from having to decide each telecommunications problem.

AT&T and the telephone companies have lost every major attempt before the FCC to stop competition. Now they have hooked on to the consumer label in an attempt to involve lawmakers who want to impress their constituents. When will Ma Bell stop this folly?


The BIT-PICKER
DON'T TELL ME COMPUTERS SAVE PAPERWORK! WITH THE INCREASE IN RECORDKEEPING MADE POSSIBLE BY COMPUTERS, WE NEED MORE PEOPLE THAN EVER FOR PAPERWORK!
- AND DON'T TELL ME COMPUTERS CREATE JOBS! AUTOMATION IS PUTTING PEOPLE OUT OF WORK EVERY DAY!
SO HOW ABOUT REHIRING THEM TO DO THE EXTRA PAPERWORK?
Computerworld

Letters to the Editor

Articles on SSA DP Management Called Vague, Unauthoritative

The latest article [CW, June 21] in *Computerworld*'s soap opera serial of attacks on Social Security Administration (SSA) DP management has reached a new low.

The bits and pieces culled from the General Accounting Office (GAO) audit must leave CW's readers with doubts as to the veracity of CW's sources and questions on the gullibility of its staff.

The article was fraught with contradictions, oversimplifications and inappropriate accusations. How can CW state that none of the 17 large-scale IBM systems reached 50% capacity "even on its busiest days," yet refer to one complex (of four systems) as "extremely busy"?

How could it be beneficial to shuttle work between complexes, yet detrimental to move a tape to a medium-scale system for listing?

And how can CW accuse the administration of old-fashioned "Second-Generation" thinking, then rail against its attempts at progress?

No reference was made to any of the variables which can affect computer utilization other than stopping the systems to change shifts. Certainly changing shifts cannot be the major cause of underutilization.

Comments from the GAO audit indicated the auditors were on a predetermined witch-hunt, made little attempt to examine the "whys" of the system and displayed an unprofessional lack of knowledge of contributing DP factors.

The reference to listing tapes on medium-scale systems as being "totally unnecessary" certainly was a cheap shot. In the first place listing output tapes represents a small portion of the total CPU time expended, so why blow it out of proportion?

Secondly, many of the tapes require special forms and priority handling.

The audit's attack on dedicated complexes and "no sharing of work" between them failed to indicate the hardware/software restraints causing the situation. The mix being processed by the systems consists of a few important major job series and many less urgent secondary series.

Each major series with its associated catalogued procedures and catalogued data sets can only be efficiently processed on one complex.

Like the GAO auditors, I too do not have all the facts. So this letter must be vague, incomplete and unauthoritative. However, I hope CW's articles will cease to be likewise.

George Towner
Computer Specialist
SSA
Baltimore, Md.

Data Past

Five Years Ago
July 14, 1971

WASHINGTON, D.C. – The Federal Bureau of Investigation's (FBI) National Crime Information Center (NCIC) won what appeared to be its first legal test when its use in a stolen car case was questioned by the defendant. The court's decision indicated a car detained at a police station after a traffic arrest could be searched without a warrant, if NCIC reported the vehicle was stolen.

– – –

WALTHAM, Mass. – Honeywell, Inc. brought out its competitor for the IBM 3 in the Model 105. The $1,700/mo system filled the gap between Honeywell's models 58 and 115, was disk-oriented with Cobol and Fortran as well as having RPG available and came partially unbundled with 30 days of on-site support, 32 hours of testing and debugging, education at Honeywell sites and software, Honeywell said.

Eight Years Ago
July 10, 1968

WASHINGTON, D.C. – The Federal Communications Commission (FCC) ruled in the Carterfone Communications case that the foreign attachments tariff had been unlawful since its inception in 1957. The commission not only found the Carterfone to be a harmless attachment to the telephone network, but also ruled all such devices were harmless and threw out the entire tariff.

– – –

WASHINGTON, D.C. – Contract negotiations for the 1968-1969 U.S. General Services Administration (GSA) time period stalled here when GSA demanded pricing discounts from suppliers of computer equipment and software and also that the suppliers stand by the facts and figures given to GSA.

Tools Aid Debugging

I read and enjoyed both the article by B.H. Boar concerning the use of dumps to debug programs [CW, April 26] and the letter from Lee Milligan [CW, June 7].

When we started our current project, we installed two valuable debugging aids:

- TRACE
- ABEND RECOVERY WITH SNAP DUMPS

The abend recovery with an eight-link dump points directly at the errant instruction. We use this feature in production so we do not burn any midnight oil correcting production problems. Our programs are BAL and are on-line multitasking.

If we find we need a full dump, we indicate that in our JCL. The only time we have needed full dumps was to correct software problems.

Paul Tedesco
Blue Cross/Blue Shield
Systems Support/Claims Adjudication
Chicago, Ill.

S.P.I.E.

Just as I was rather deeply embarrassed not to have heard of the enormous computer hobbyist movement until just the other day, so I am embarrassed not to have heard until now of the S.P.I.E., the Society of Photo-Optical Instrumentation Engineers, headquartered in Southern California, You see, I was once an optical engineer, during World War II (repeat, II!), and attended meetings, heard and gave papers, and in fact worked up to national program chairman of the Optical Society of America. I dropped out in the early Fifties, but switched off my hearing aid completely only three or four years ago.

This new bunch has taken over a fair part of the more exotic optical work. The theoretical optics people (corresponding to computer science in our field), the spectroscopists and physiological optics researchers, all adhere to the OSA, but the laser boys, the lens designers, and especially the chip and chip mask "artists," are served by this novel organization. S.P.I.E. runs a series of seminar-meetings in each of its subject areas, and the latest was "Developments in Semiconductor Microlithography," in San Jose June 1-3.

When I registered, I found that there had been a previous session, "Advances in Photofabrication Imagery," in San Diego two years ago – and I got a copy of the proceedings, so I am at least catching up!

There was a small but extremely technical exhibit, mostly of inspection and measuring devices in LSI inspection and mask production. And at the San Jose gathering, there was a banquet speech on the Viking mission to Mars, and the life detection experiments aboard (heavily microprocessor controlled).

I was particularly interested in papers by IBM engineers on fine-detail mask requirements, with "error budgets" dividing the six or more sources of imprecision so as to achieve overall accuracy of 0.5 micrometer (formerly named "micron," or one-thousandth of a millimeter) – that's one-fifth of one ten-thousandth of an inch, about the wavelength of light. Most of the slides were of SEM (scanning electron microscope) results: even *production* chips are getting down below what we can clearly see with an optical microscope! While not explicitly identified, the ones described might well be the ones in the new IBM 5100, which is the current leader industry-wide in fineness of detail.

This was followed by a Texas Instruments thingy on submicron X-ray mask and chip production, but by research people who didn't really have much to sell. The last paper of the session, however, was by the top technicker from an outfit called E-Tech, which is building and selling very advanced electron beam mask cutting equipment, the fanciest units being in the $1.5 million dollar range. So Dr. Yew was very hot to trot, and trotted well.

Most readers would not be as fascinated by the technology as I was, but everyone who wonders what the fifth and sixth generation of data processors will be made of, and how much they will cost, has some stake in this latest advance. E-Tech and its competitors hope to carve the *masks* for say, 16K chips at the rate of one full 3-inch wafer surface every ten minutes. That's more than a hundred identical masks; ten or more *different* masks are currently required to make one sexy chip, and the number of layers is going up slowly but steadily.

This is the *one* beam, finer than even a very narrow laser – finer than a needle point. Now, if masks can be made competitively that way with one cutting beam, imagine the economics with a hundred, or some day ten thousand, parallel cutting beams. No more masks, of course; they'll cut the chips directly. The chip patterns will be far finer and more complex than today – a whole 370 CPU on a single "device" – but the masks, if photographic reproduction were not ruled out by the coarseness of even ultraviolet light, would of course also be equally complicated.

This is how a philosopher, an overviewer like me, can make judgments about highly technical futures without really mastering the technology itself. I can be nearly one hundred percent sure that masks and photo replication will disappear, that chips will be carved directly (the multilayer nature of the device is of course a very tough problem, but materials research always comes through!), and that hundreds of thousands, even millions of elements per chip can be achieved.

It is interesting to compare the papers I describe above with the printed proceedings of the earlier conference. Only two years later 21 months, in fact but the tone is already different In the 1974 papers, the research and the inspection tools were optical, for the most part. Electron micrographs of sample chip areas were common, to show fine detail unobtainable with a light microscope but only one paper, the last in the book, mentions electron beam "fabrication." The small company concerned, Radiant Energy Systems, had some estimates of mask cutting that must have been startling even to the experts, in 1974. The 1976 meeting appeared to confirm the physical estimates (resolution under 1.0 micrometer, accuracy better than 0.25 micrometer), and the E-Tech 1976 economic promises were considerably better than the RES hopes of 1974 (10 minutes per 3-inch master, versus "less than an hour" for a 2.5 inch).

That sounds to me like real progress: a production machine; economies ahead of schedule (I think; dollar figures are missing in 1974, but the machine *looks* expensive in a laboratoryish sort of way); no new problems publicly stated or heard around the luncheon table; larger session attendance; and questions from factory engineers rather than physicists. Yes, the next generation is coming. Hi ho, Electron Beam!

Herb Grosch

BankAmericard Descriptive Billing Now Hitting Mark

By Alan Taylor
Of the CW Staff

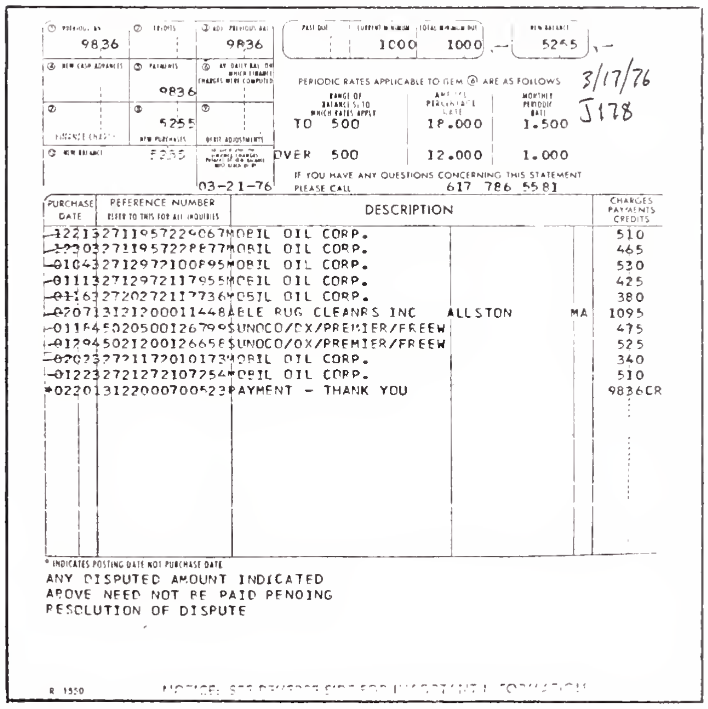
The State Street Bank in Boston has come out with a new BankAmericard descriptive billing statement which is very different – and much better – than the one described here recently [CW, Feb. 9]. After a number of internal delays, it was put into operation in May and has attracted a number of pro and con comments.

The form (Figure 2) does show a very different approach to providing information to the user than the earlier one did (Figure 1), and to my way of thinking it is very much better.

The differences between the two forms fall into two areas – those parts that have been changed and those that have been added. There are three areas that have been added to the form – a billing day count, a summary debits and credits totals line and specific posting dates.

The billing day count is needed because of the use of an "average

(Continued on Page 16)



① PREVIOUS BAL 98.36	② CREDITS	③ ADJ. PREVIOUS BAL 98.36
④ NEW CASH ADVANCES	⑤ PAYMENTS 98.36	⑥ AV. DAILY BAL. ON WHICH FINANCE CHARGES WERE COMPUTED
⑦ FINANCE CHARGE	⑧ NEW PURCHASES 52.55	⑨ DEBIT ADJUSTMENTS
⑩ NEW BALANCE 52.55		03-21-76

PAST DUE | CURRENT MINIMUM 10.00 | TOTAL MINIMUM DUE 10.00 | NEW BALANCE 52.55

PERIODIC RATES APPLICABLE TO ITEM ⑥ ARE AS FOLLOWS

RANGE OF BALANCE(S) TO WHICH RATES APPLY	ANNUAL PERCENTAGE RATE	MONTHLY PERIODIC RATE
TO 500	18.000	1.500
OVER 500	12.000	1.000

3/17/76
J178

IF YOU HAVE ANY QUESTIONS CONCERNING THIS STATEMENT PLEASE CALL 617 786 5581

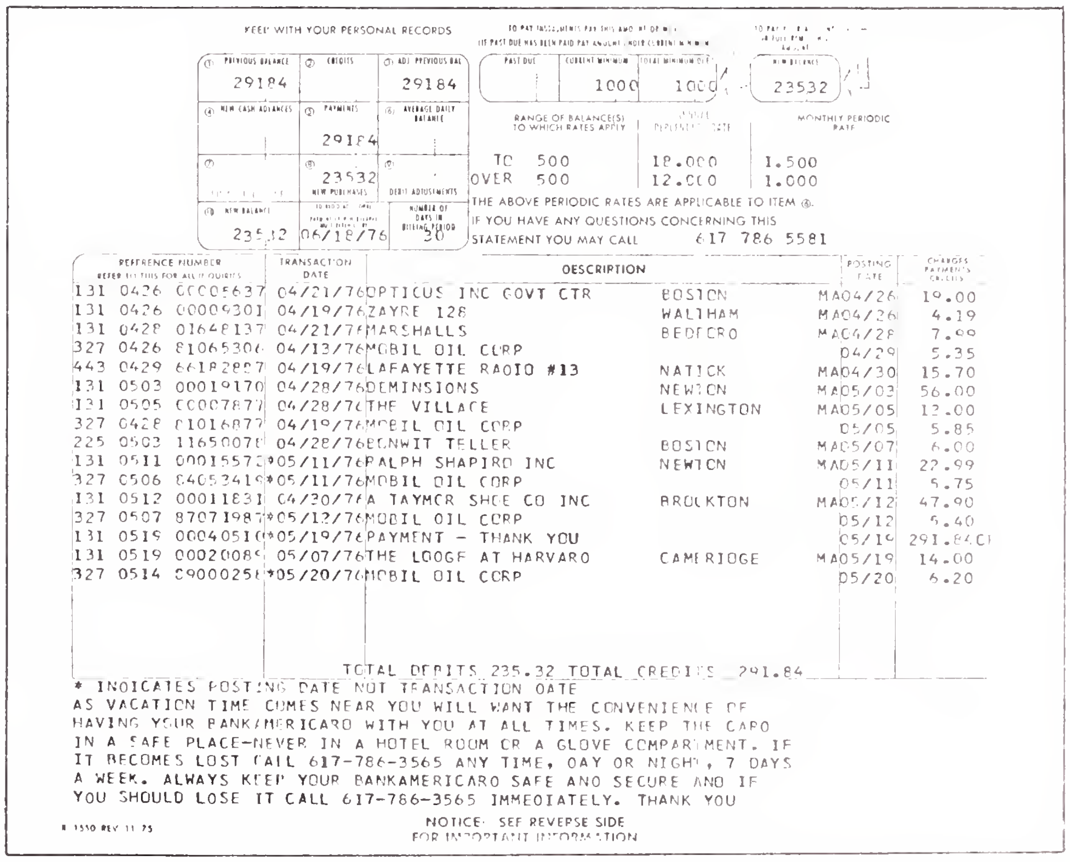
PURCHASE DATE	REFERENCE NUMBER REFER TO THIS FOR ALL INQUIRIES	DESCRIPTION			CHARGES PAYMENTS CREDITS
1221	32711957229067	MOBIL OIL CORP.			510
1220	32711957228877	MOBIL OIL CORP.			465
0104	32712972100895	MOBIL OIL CORP.			530
0111	32712972117955	MOBIL OIL CORP.			425
0116	32720272117736	MOBIL OIL CORP.			380
0207	13121200011448	ABLE RUG CLEANRS INC	ALLSTON	MA	1095
0116	45020500126799	SUNOCO/DX/PREMIER/FREEW			475
0129	45021200126658	SUNOCO/DX/PREMIER/FREEW			525
0202	32721172010173	MOBIL OIL CORP.			340
0122	32721272107254	MOBIL OIL CORP.			510
*0220	13122000700523	PAYMENT – THANK YOU			9836CR

* INDICATES POSTING DATE NOT PURCHASE DATE

ANY DISPUTED AMOUNT INDICATED ABOVE NEED NOT BE PAID PENDING RESOLUTION OF DISPUTE

R 1550 NOTICE: SEE REVERSE SIDE FOR IMPORTANT INFORMATION

Figure 1. An example of BankAmericard's old-style billing.



KEEP WITH YOUR PERSONAL RECORDS

① PREVIOUS BALANCE 291.84	② CREDITS	③ ADJ. PREVIOUS BAL 291.84
④ NEW CASH ADVANCES	⑤ PAYMENTS 291.84	⑥ AVERAGE DAILY BALANCE
⑦	⑧ NEW PURCHASES 235.32	⑨ DEBIT ADJUSTMENTS
⑩ NEW BALANCE 235.32	06/18/76	NUMBER OF DAYS IN BILLING PERIOD 30

PAST DUE | CURRENT MINIMUM 10.00 | TOTAL MINIMUM DUE 10.00 | NEW BALANCE 235.32

RANGE OF BALANCE(S) TO WHICH RATES APPLY	ANNUAL PERCENTAGE RATE	MONTHLY PERIODIC RATE
TO 500	18.000	1.500
OVER 500	12.000	1.000

THE ABOVE PERIODIC RATES ARE APPLICABLE TO ITEM ⑥.
IF YOU HAVE ANY QUESTIONS CONCERNING THIS STATEMENT YOU MAY CALL 617 786 5581

REFERENCE NUMBER REFER TO THIS FOR ALL INQUIRIES	TRANSACTION DATE	DESCRIPTION			POSTING DATE	CHARGES PAYMENTS CREDITS
131 0426 00005637	04/21/76	OPTICUS INC GOVT CTR	BOSTON	MA	04/26	19.00
131 0426 00009301	04/19/76	ZAYRE 128	WALTHAM	MA	04/26	4.19
131 0428 01648137	04/21/76	MARSHALLS	BEDFORD	MA	04/28	7.99
327 0426 81065306	04/13/76	MOBIL OIL CORP			04/29	5.35
443 0429 661828?7	04/19/76	LAFAYETTE RADIO #13	NATICK	MA	04/30	15.70
131 0503 00019170	04/28/76	DEMINSIONS	NEWTON	MA	05/03	56.00
131 0505 00007877	04/28/76	THE VILLAGE	LEXINGTON	MA	05/05	12.00
327 0428 01016877	04/19/76	MOBIL OIL CORP			05/05	5.85
225 0503 11650078	04/28/76	BONWIT TELLER	BOSTON	MA	05/07	6.00
131 0511 00015572	*05/11/76	RALPH SHAPIRO INC	NEWTON	MA	05/11	22.99
327 0506 84053419	*05/11/76	MOBIL OIL CORP			05/11	5.75
131 0512 00011831	04/30/76	A TAYMOR SHOE CO INC	BROCKTON	MA	05/12	47.90
327 0507 87071987	*05/12/76	MOBIL OIL CORP			05/12	5.40
131 0519 00040510	*05/19/76	PAYMENT – THANK YOU			05/19	291.84CR
131 0519 00020089	05/07/76	THE LODGE AT HARVARD	CAMBRIDGE	MA	05/19	14.00
327 0514 09000258	*05/20/76	MOBIL OIL CORP			05/20	6.20

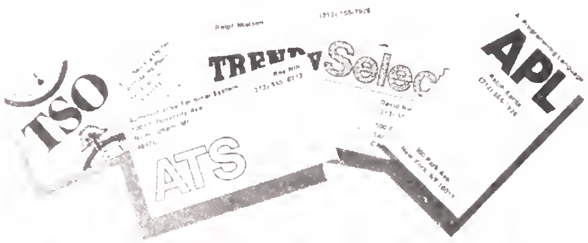
TOTAL DEBITS 235.32 TOTAL CREDITS 291.84

* INDICATES POSTING DATE NOT TRANSACTION DATE
AS VACATION TIME COMES NEAR YOU WILL WANT THE CONVENIENCE OF HAVING YOUR BANKAMERICARD WITH YOU AT ALL TIMES. KEEP THE CARD IN A SAFE PLACE–NEVER IN A HOTEL ROOM OR A GLOVE COMPARTMENT. IF IT BECOMES LOST CALL 617-786-3565 ANY TIME, DAY OR NIGHT, 7 DAYS A WEEK. ALWAYS KEEP YOUR BANKAMERICARD SAFE AND SECURE AND IF YOU SHOULD LOSE IT CALL 617-786-3565 IMMEDIATELY. THANK YOU

R 1550 REV 11 75 NOTICE: SEE REVERSE SIDE FOR IMPORTANT INFORMATION

Figure 2. An example of BankAmericard's new descriptive billing.

To match our terminal systems, you could deal with at least five different salesmen...



and still worry about service.

See us instead! We supply cost-effective terminals for every application, including these:

ATS–The Trendata 4000, with its Selectric-style keyboard and 30 cps printer in an attractive console, provides 2741 compatibility plus higher performance. Computer-controlled margins, spacing, horizontal/vertical tabs, and pagination for fast, crisp forms printing.

APL–Our Model 4000 offers total compatibility with USASCII, Correspondence, and EBDIC code sets in this powerful timesharing mode. Typewriter paired keyboard has keytops engraved with APL characters for ease of data entry.

TSO–TTY 33/37 or IBM 2741 compatibility at the flick of a switch . . . 132 or 158 print positions, also switch selectable . . . typewriter-style keyboard with ANSI, Correspondence, or EBCD layout . . . all on our Model 4000.

TRENDwriter–Teletype-compatible 30 cps TRENDwriter with full 132 print positions is the ideal replacement for KSR teletypewriters. Matrix printer . . . full USASCII character set.

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BankAmericard Billing Seen Hitting the Mark

(Continued from Page 15)

daily balance" in the finance charge calculations. Customers wanting to check the average balance finance charge have to use the average daily balance. While the bank's opinion of what this is is given in Box 6, the careful customer may want to recompute it.

There is nothing on the statement which tells him the starting and ending date of the billing cycle – so billing day count is essential information which wasn't given previously.

So is the addition of specific "posting dates." As a matter of fact, I find this addition doubly acceptable. It gives information, and it helps understanding.

Not everyone with a credit card understands the delays that occur between purchases, credits and postings. As a matter of fact, not everybody understands the terms themselves. So the mere inclusion of the two different dates is educational in itself. That is a real improvement. Even if nothing else were provided by the entry, this would be a major step forward.

Something else is provided in this case. The posting date permits the balance information to be worked out – again a necessary operation for anyone checking the finance charges. Previously the posting date was not provided unless the transaction date was missing, which prevented people from being able to check to actual daily balances.

The third area added is the total debits and credits line at the bottom of the transaction block. Although it can't be seen from the example shown, this does total all debits and all credits except the finance charge data.

Got the Point

The changed fields, however, are getting somewhere near perfect. State Street/BankAmericard has clearly got the point that data has to be readable. In place of the old, cramped, misaligned and hard-to-read entries, there are reference numbers in three intelligible groupings, dates with years included, slash separators and decimal points separating dollars and cents.

They have also added a separator between the merchant identity field and the location field, although since the identities in this example have not been expanded to take up the newly expanded field space, there is no way of seeing this as yet.

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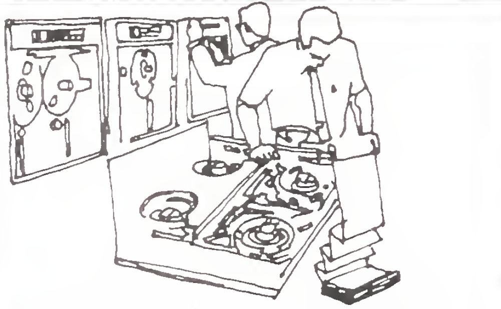
OVER 700 DP Managers now use the JOHNSON JOB ACCOUNTING REPORT SYSTEM



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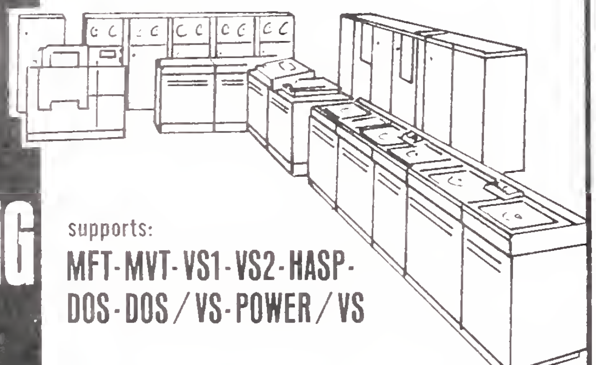

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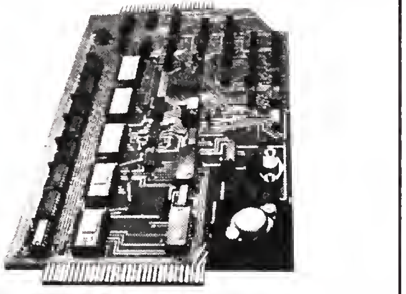

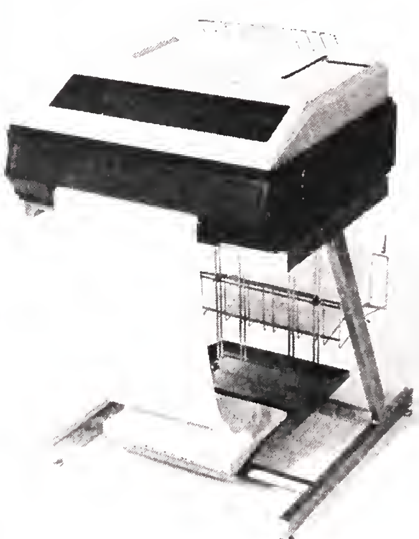

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Packaged Service Called Real Alternative to Mini

By Don Leavitt
Of the CW Staff

WELLESLEY, Mass. – Keydata Corp. has announced a packaged time-sharing service to provide small businesses with a "low-cost, risk-free alternative to the minicomputer," according to a spokesman.

Designed for distribution and manufacturing companies in the $750,000 to $5 million annual sales category, the service is called System 800 because it offers specific applications – billing, inventory control, accounts receivable and sales analysis – as well as a variety of monthly and quarterly management reports for $800/mo on a one-year contract.

The vendor uses a unit of measurement called a Keydata Resource Unit (KRU) which consists of four factors – number of customer invoices, average number of invoice lines, number of customer records and number of item records – to determine if a company's processing requirements can be met for the $800/mo price.

Most companies with annual sales in the $750,000 to $2 million range will fit within the formula; companies with annual sales up to $5 million whose requirements only exceed the formula by a small amount will be offered the option of paying an additional $4.75/mo for each 1,000 KRUs in excess of the 175,000 included in the basic monthly price, the spokesman noted.

System 800 service includes:

- Use of a General Electric Terminet 300 in the user's office and maintenance of that terminal for the life of the contract.
- Performance of billing, inventory control, accounts receivable and sales analysis on-line with 2 sec response.
- On-line access to Keydata's computer center in Foxboro, Mass., 14 hours a day, five days a week and 10 hours on Saturday.
- Access to the Keydata computers through the company's nationwide data communications network.
- The ability to link up to three locations to the company's central data base.
- Six monthly management reports and two quarterly reports.

The reports include a monthly customer activity analysis, monthly stock status/item sales analysis, quarterly updated customer list and quarterly item list plus a choice of four of the following six monthly accounting reports: invoice and credit memo register, tax register, a commission report, a transaction register, an open item aged trial balance and monthly customer statements.

Cost of the private communications links between user sites and Keydata's data center or multiplexers is borne by the user under System 800. This would typically amount to an extra $35- to $50/mo, Keydata estimated.

In addition to a monthly packaged price for the service, Keydata is offering fixed-price data conversion and start-up support for $2,500.

The firm is at 20 William St., Wellesley Office Park, Wellesley, Mass. 02181.

DEC Adapts IDMS to Run on PDP-11/70

MAYNARD, Mass. – Based on IDMS, Cullinane Corp.'s data base management system, DBMS-11, has been introduced by Digital Equipment Corp. for use on PDP-11/70s running under the Interactive Application System (IAS) control software.

At the same time, DEC also announced RMS, which it described as a multikeyed indexed data access function for use under Resource Sharing/Time-Sharing (RSTS/E) on the PDP-11/34, -45 and -70 computers.

Sticking as close to IDMS as possible, the developers of DBMS-11 had to make changes to accommodate the change in word size from the IBM 360, on which the Cullinane package had been created, to the DEC hardware.

Aside from that, the DEC implementation also included some of the data manipulation language specifications in the *1975 Codasyl Cobol Journal of Development* that simply did not exist when IDMS was first put together, DEC said.

Cullinane is also implementing these changes in IDMS, a DEC spokesman noted.

Less Than 1% Change

DBMS-11 represents "less than a 1% change from IDMS," he said. However the products may not stay that close in future. DEC expects to create "a full line of data base products" for use across the PDP-11/Decsystem-20 range, he explained, and that may mean DEC has different purposes for DBMS-11 than Cullinane has for IDMS.

Although DBMS-11 is currently limited to IAS environments, he noted the company "certainly expects to migrate the system" to other operating systems as well.

RMS-11 was created in-house by DEC and is said to support the features of ANS Cobol '74 Level 2 Indexed I/O module specifications, providing the user a multikeyed Isam facility. Its logic allows sequential, relative and indexed file organizations and that, in turn, supports sequential, random and direct physical data access, the vendor claimed.

"Dynamic" access – allowing a combination of access modes – is also supported, DEC said. RMS-11 backs the use of fixed- and variable-length records, includes multilevel privacy control and provides generic and approximate key searches, the spokesman continued.

Although DEC has configured a hardware/software package (called the 11B/70) to utilize the DBMS-11 facilities, the data base software is also available separately for $15,000, the spokesman noted.

RMS-11 is licensed for $2,500 as an option to RSTS/E and can run on any configuration that supports that operating system, DEC said.

Data General Cobol Validated; Most 'Errors' Considered Minor

WASHINGTON, D.C. – The Cobol compiler developed by Data General Corp. for use with its Eclipse C-300 computer stood up well in an audit conducted by the Federal Cobol Compiler Testing Service (FCCTS), a summary report of the results indicated.

Limited to evaluating compliance with Federal Information Processing Standards for the so-called Low-Intermediate implementation of the 1974 American National Standards Institute (Ansi) specifications, the audit routines identified 11 situations as error conditions.

In general, the error flags neither surprised nor disturbed Data General. In several instances, the "errors" referred to facilities the vendor did not choose to implement within Cobol – the Debug module, for example – because it felt it already had a better facility outside the language, a spokesman said.

In other situations – notably the Nucleus' inability to handle COMPUTATIONAL data items longer than 16 digits in accordance with the Ansi "rules" – the problem goes back to machine architecture. Data General has no reasonable means of changing that to comply with the federal audit routines, he added.

'Not Real Errors'

A series of five conditions identified as errors within the Relative I/O module are seen by Data General as the most serious of all the items noted by the FCCTS, "but even these aren't real errors in view of the way we implemented that module," the spokesman contended.

While the vendor would be expected to see the results positively, other observers appear impressed with the Data General results. "It's the closest I've seen to compliance with the '74 specifications, on a small machine," according to one outside source.

The Validation Summary Report for the Data General computer is expected to be ready for distribution in the next several weeks, through the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161.

Infonet Adds Econometrics Tool

EL SEGUNDO, Calif. Time Series Processor (TSP), a statistical analysis program used in econometrics research, is now available on Infonet, Computer Sciences Corp. (CSC) international remote computing service. Originally developed at MIT and Harvard University and enhanced by CSC, the program now operates in both conversational and remote batch modes.

TSP's preprogrammed functions cover the computational steps that normally occur in econometrics research, including regression and simulation procedures, matrix operations and series generators. Miscellaneous procedures available through TSP include actual and predicted series comparision, analysis of estimated parameters, covariance and correlation analyses, divisia index procedure and principal components analysis, a spokesman said.

TSP also operates as a programming language, enabling the analyst to structure his own program with as complex a branching logic as he desires and to create a data base to store and update statistical information. Data base maintenance is flexible since TSP allows both fixed and free format input, the company noted.

CSC is headquartered at 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

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Set For December Start

Service Planned to Poll On-Site Monitors

RESTON, Va. - The Performance Monitoring Network (Permonet) service from CACI-Performance Services is being designed to provide hardware monitoring and analysis at less cost than if users tried to do the work themselves, CACI said.

Aiming to help the medium-scale and smaller installation, Permonet now expected to go into operation in December – will include installation of a monitor at the user site, remote collection and computer-generated analysis of the performance data and periodic on-site review by a CACI analyst, the vendor explained.

The monitors to be used will "probably be Tesdata MS32-type" units and they will normally be polled every eight hours by CACI's CPU, a spokesman continued.

Real-time reports will be generated, however, whenever the monitor recognizes user-defined performance thresholds have been passed, he said.

Daily, weekly, monthly and quarterly reports will provide analyses of actual operations and trending patterns from longer perspectives. Though CACI personnel typically will visit user sites only quarterly, ,they will review each client's data daily, the spokesman added.

Permonet facilities are viewed by CACI as a logical first step in performance measurement and management for "any DP installation" and as a complete capability for sites of moderate proportions. They may also serve to supplement efforts already started by large-scale DP operations.

Since the monitors will be purchased in bulk by CACI before redistribution to user sites, the unit cost will be lower than it would be for the individual buyer. Other cost savings will occur, CACI said, because the user will not need a performance analyst on his staff.

Permonet is being sold on a one-year subscription basis for $3,000/mo with a discount to users who subscribe before Sept. 30. CACI-Performance Services is at 1920 Association Drive, Reston, Va. 22091.

'Decs' Uses 3270 in Data Entry

RICHMOND, Va. – The Data Entry Control System (Decs) from The Computer Software Co. is an on-line keypunch replacement which provides IBM 3270 CRT support for data entry and verification and remote job initiation to IBM 360/370 CPUs, the vendor said.

Existing application programs can be used without change since output from Decs can be formatted to match the input requirements of the processing runs, according to the company.

Job control statements designating card input would have to be modified, a spokesman acknowledged.

No Need for Monitor

The software supports both local and remote 370s, functions as a "stand-alone" system and does not require the use of a teleprocessing monitor such as IBM CICS, he said. Decs can be used under DOS, DOS/VS or Computer Software's Extended DOS (Edos), he added.

While support for concurrent keying and verification of data is one of the major operator-oriented features of the system, on-line training and prompting facilities are also important, the vendor said. So is the ability to accumulate and display batch totals on numeric fields, it added.

On another level, backing for automatic restart/recovery is also part of Decs, as is – for Edos users – interactive interfacing with that operating system's procedure library and Extended Spooling Facility, the spokesman noted.

Decs requires 24K bytes of main memory and is available for $5,500 or $140/mo from the company at 6517 Everglades Drive, Richmond, Va. 23225.

'Inquire' Enhancements Speed Data Base Chores

FALLS CHURCH, Va. – IBM 360/370 installations working with Inquire from Infodata Systems, Inc. have reduced CPU time and dollar costs for many operations by as much as 85% as a result of recent enhancements to the data base mangement system, according to vendor claims.

Release 8-1, recently shipped to current users, reduces both CPU time and memory requirements for the English-like command language portion of the system, a spokesman noted.

The command language provides rapid searching with multiple keys as well as data manipulation and reporting facilities, he said.

Inquire was earlier enhanced by the addition of a Procedural Language Interface (PLI) which allows programs written in the user's normal host language – Assembler, Cobol, Fortran or PL/I – to access Inquire data bases.

This feature can be utilized in a multithread, high-volume transaction-oriented processing environment, Infodata said.

This spring the vendor revised the way the system allows the user to change keys or indexes. Now based on field change transactions, this has reduced the cost of this type of operation by 85%, the company said.

The full Inquire system requires a minimum of 130K bytes of main storage, but more typically utilizes 150K to 200K; it functions under either OS or OS/VS.

The basic system, made up of the command language processor and utilities, costs $39,500. The complete system with PL/I costs $80,000, Infodata said from 5205 Leesburg Pike, Falls Church, Va. 22041.

AMA Publishes Software Handbook

NEW YORK – Amacom, a division of the American Management Associations (AMA), has published the *Handbook of Data Processing Administration, Operations and Procedures* by S.R. Mixon.

Described as a guide to solving the problems inherent in software development, operations and maintenance, the book can speed up the system development process 15% to 30% and reduce maintenance costs through a common design philosophy and standard documentation, Amacom claimed.

The nearly 400 pages give management tools for controlling projects and provide "guidelines for ANS Cobol, modular programming, standardized program coding, automated documentation, creation of the data element dictionary and much more," according to the AMA.

The handbook has been structured and written for use by readers with varying degrees of DP experience, a spokesman added. The five sections include an overview and detailed project management methods, design standards, documentation standards and Cobol standards, he said.

The handbook can be ordered for $24.95 from the AMA at 135 W. 50th St., New York, N.Y. 10020.

'Best' Condenses Data for IBM 3

SILVER SPRING, Md. – By condensing and later restoring data, the Bit Efficient Storage Technique (Best) package from Standard Software Co. is said to reduce the storage needs of IBM 3 users, but still allow them to access data at the field level.

Condensing differs from compressing data, the vendor said, noting Best reduces fixed-length fields to smaller but still fixed-length fields so start points can be identified.

Best is used at the application program level and can be applied field by field, the firm said.

Available in object code on 96-column cards or on user-supplied diskette or disk, the software costs $1,440 or $30/mo and can be ordered from Standard through P.O. Box 1434, Silver Spring, Md. 20902.

Name Changed

CUPERTINO, Calif. – Measurex Corp. has changed the name of its family of product throughput control systems from "System 2000" to "Measurex 2000."

The name "System 2000" was used by MRI Systems Corp. prior to Measurex's use of it, and the change was made to prevent confusion in the industries served by both companies, a Measurex spokesman noted from One Results Way, Cupertino, Calif. 95014.

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MISSISSIPPI STATE CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 508 Robert E. Lee Bldg., Jackson, MS, 39202, up until 2:00 p.m. 7-26-76 for the following data processing equipment:

Request for Proposal No. 249 for the purchase of an 8K memory upgrade, a link diskette, and a floating point processor to interface with an existing Artronix PC-12/730 medical system.

Request for Proposal No. 250 for the lease or purchase of software to maintain and provide reports from water well record data accumulated by the U.S. Geological Survey.

Request for Proposal No. 251 for the lease or purchase of a micro-processor capable of asynchronous communications with an existing Xerox Sigma 9 computer system.

Request for Proposal No. 252 for the lease or purchase of an easy to use report generator type language to run on a 370/155 system and to be used by non-technical personnel.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities. Clyde P. Ballard, Executive Director, Central Data Processing Authority.

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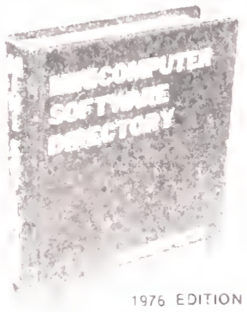
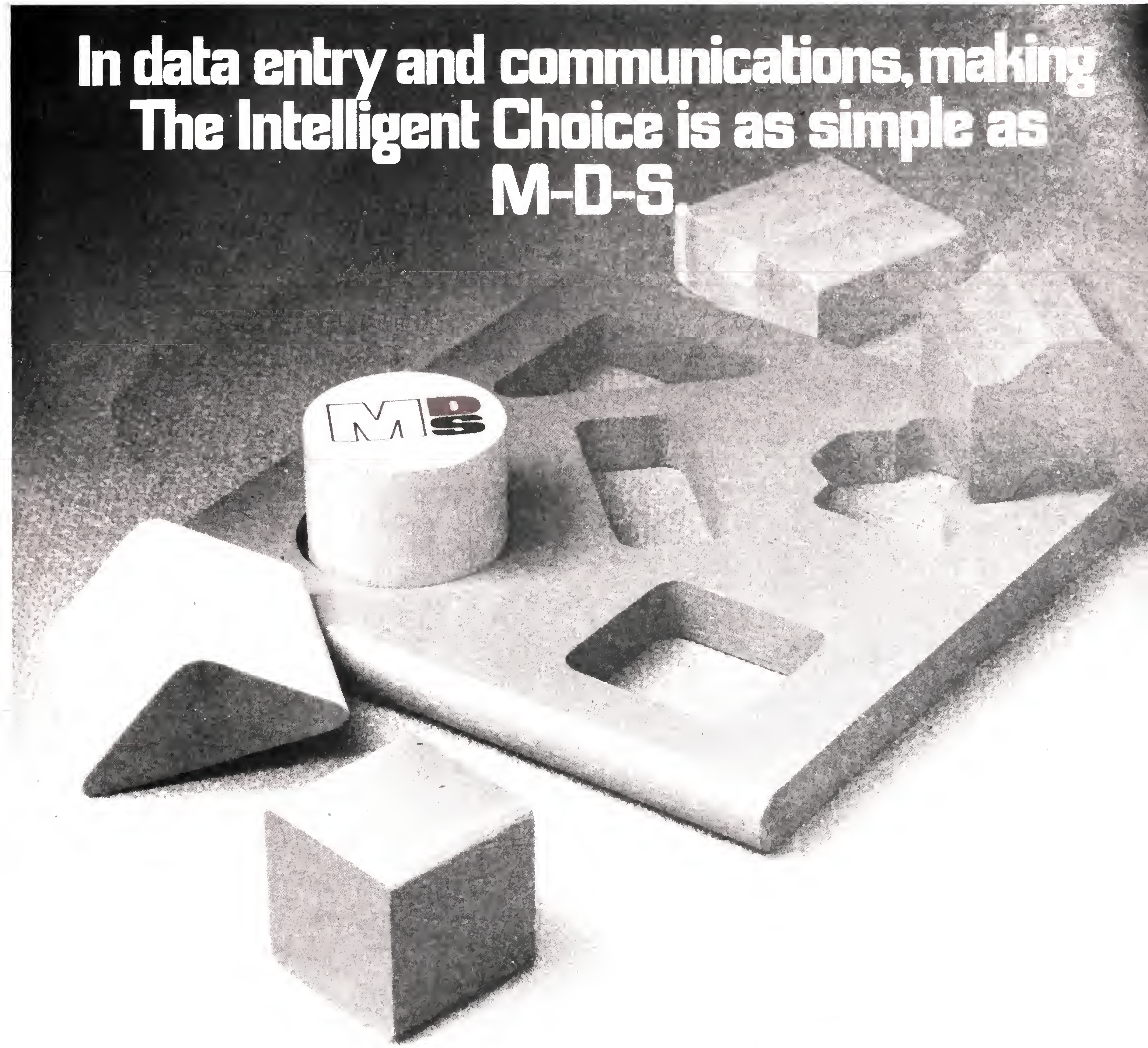


1976 EDITION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Our technology is backed up by MDS quality. We manufacture our own equipment to the most exacting standards in our own modern production complex. To support our far-reaching international operations, we also maintain an extensive engineering and support facility in Europe. Over 1000 MDS Consumer Engineers are dedicated to satisfying the client. When one of our products—or a company-wide network of our products—is delivered to you, our relationship has just begun.

If your data processing system looks more like a puzzle than a solution, Mohawk Data Sciences will help you to put the pieces together. We've done it for a majority of the Fortune 500 companies. A call or letter to your nearest MDS office will show you why we are the Intelligent Choice for you, too.

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Parsippany, N.J. 07054
(201) 540-9080

MDS CANADA, LTD.
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MDS INTERNATIONAL SERVICE CORP.
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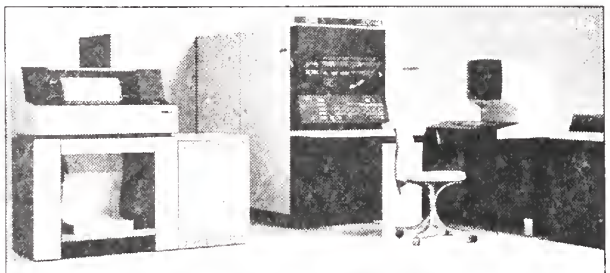
The Intelligent Choice.

MDS System 2300. The System 2300 is an intelligent terminal offering computer-compatible data capture, simultaneous with Document Processing at the source. The 2300 is also capable of RJE Communications.

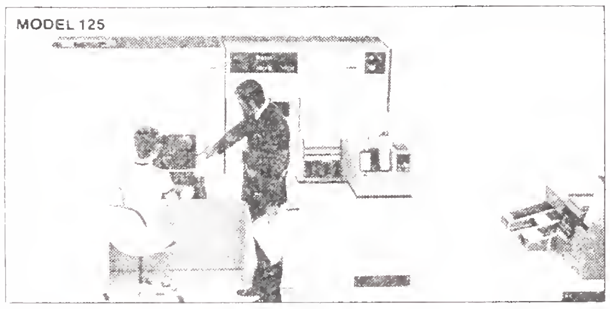
IBM's System/370 grows again to meet tomorrow's needs.

Both this model and the Model 148 feature a standard 1,920-character display console and keyboard for swift, effective communication with the system.



In addition to peripheral printers, one or two 3203 Model 4 Printers can be attached directly to the 148 or 138. The new 3203 is rated at 1200 lines per minute.

JUNE 30, 1976



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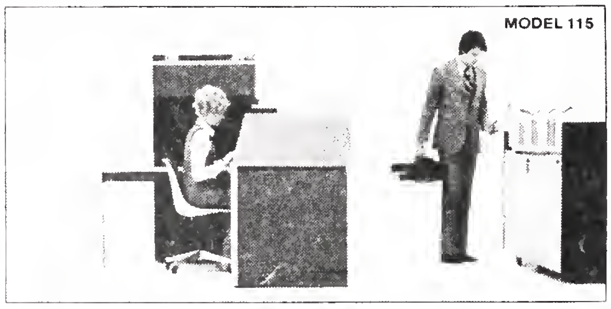

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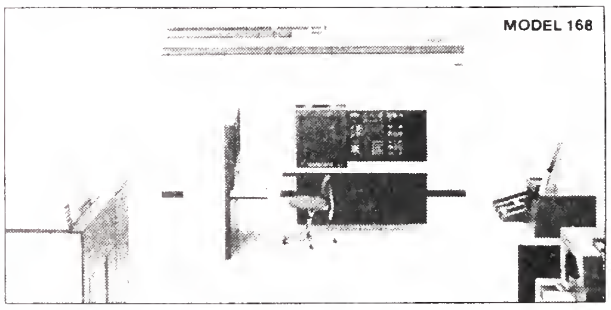

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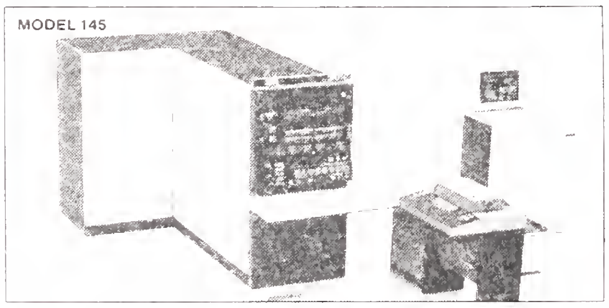

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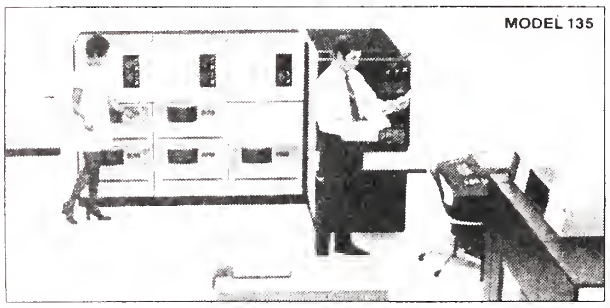

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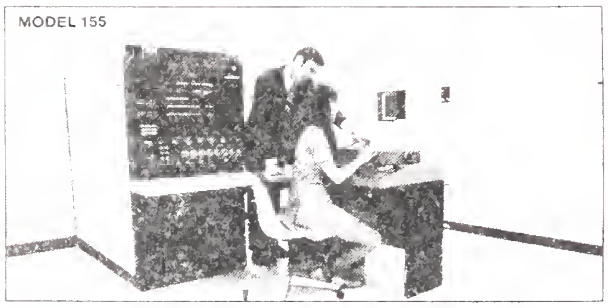

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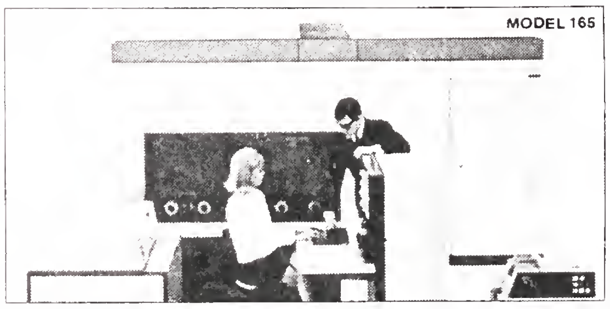


1970

Since it was introduced, the IBM System/370 has been a dynamic, evolving computer line—in terms of the computers themselves, their operating systems and input/output devices. Now System/370 again sets new levels of performance and efficiency with the introduction of two more virtual storage computers, the Models 138 and 148.

The new computers can provide the power to expand data base and communications capabilities. They can aid a move into the productive environment of interactive computing. They can mean adding a range of business-building applications that may have been deferred for lack of capacity.

More work at lower cost

Both new models provide clear-cut evidence of the continuing advances in technology behind the System/370. For growth-minded users, this translates into the solid advantages of more work accomplished at a lower cost.

In support of such progress, the Model 148 offers a main storage up to twice as large as that now used by most 145 users. The 138 has double the maximum storage of the 135. Internal performance of both models is significantly faster than that of their predecessors—the 148 offers up to 43% improvement, the 138 up to a 36% gain.

Numerous other advances lead to increased operating efficiency. A new Hardware Performance Assist gives VS 1 and Virtual Machine/370 users an additional performance boost. A greatly enlarged control storage allows for concurrent use of standard and optional features, eliminating configuration tradeoffs. And many previously optional features are standard with the Models 138 and 148.

Substantial price/performance gains over the 135 and 145 are thus made possible with the new models. With them, the "intermediate" system takes on many of the characteristics of powerful, large-scale computing.

For more information on the Models 138 and 148, call your IBM Data Processing Division marketing representative. Or write to the IBM Corporation, Dept. 83F, 1133 Westchester Avenue, White Plains, N.Y. 10604.

IBM®
Data Processing Division

'Solis' Manages Bank Queries, Tracks Related Accounts Data

DALLAS – National Sharedata Corp., which performs facilities management services for banks, has announced a service developed to provide on-line processing, reporting and maintenance of a bank's customer banking activities.

The Sharedata On-Line Information Systems (Solis) reportedly provides capabilities for three basic bank applications: account inquiry, customer cross-relation information and data capture at the source.

Solis integrates these applications so a bank has fast access to information on all customer accounts and the services it provides to each through a centralized data file, National Sharedata said.

The system is modular so it can utilize a bank's basic accounting system as a foundation for the bank's future asset, financial and executive management systems, as well as for electronic funds transfer (EFT) systems, according to a spokesman.

Several National Sharedata clients have begun using expanded capabilities of Solis to introduce EFT systems, he noted. One bank client has developed a check guarantee system and is now planning a point-of-sale system; another is developing a point-of-sale system; and a third has developed an automated teller installation.

Bank services handled within Solis are said to include demand deposits, savings, certificates of deposits, installment loans and commercial loans.

To access the data file, personnel can make entries and inquiries or update information at any time by using telephone audio-visual display and hard-copy terminals linked to the bank's central computer facility; the terminals are located at teller stations and other key points in the bank, the spokesman said.

Solis was designed so detailed account information is furnished at the bank's operational levels, customer status information is available at the bank customer level and key management information is consolidated and presented to executive management for financial planning and control, according to the vendor.

Available without additional cost to current National Sharedata clients, Solis can be installed at a new user's site subject to negotiated price, the vendor said from 800 One Main Place, Dallas, Texas 75250.

Developer Seeking Bank as Test Site

WEST CHESTER, Pa. – Data Base Systems, Inc. said it has completed the design of an on-line bank deposit system with electronic funds transfer (EFT) features and is now seeking a bank with the necessary hardware/software configuration to serve as a development site.

Clearly IBM-oriented, the package utilizes "current versions" of IMS and CICS, according to its description, which referred presumably to VS implementations of those systems.

Three phases of development have been scheduled: an independent batch system, to be complete by July 1, 1977; administrative teleprocessing, by Nov. 30, 1977; and EFT automated station/teller teleprocessing, by April 28, 1978.

When complete, the package is expected to handle demand deposit accounts, regular and restricted savings accounts, clubs and pensions. It will be based on a descriptive "unistatement" showing activity and status of all accounts for each bank customer.

The system will permit automatic interaccount transfers, preauthorized payments and entries from automated clearinghouses as well as more conventional banking transactions, a spokesman explained.

The designers ultimately expect to support entries from automated teller machines and point-of-sale units in merchant locations. The package also will manage stop-payment and "hold" messages, the company said.

Management will be aided through related account analysis, earnings/account profitablility studies and a parameter-driven report generator.

The company has not yet estimated what the complete system or any of its parts – assuming it will be modular – will cost. It noted, however, that any bank with which it works will be able to acquire the system for a "significantly reduced fee."

Data Base Systems, Inc. is in the Darlington Building, West Chester Plaza, West Chester, Pa. 19380.

'Opsys 1' Drives CA Minis

BELMONT, Calif. Opsys 1 from Systems Pro Tem is a disk operating system designed to support both program development and productive operations in batch mode on Computer Automation, Inc. (CA) 16-bit minicomputers, including the 2/05 "Millicomputer."

An assembler is included along with a free syntax text editor suitable for maintaining source programs for the assembler, the vendor noted.

Opsys 1 is said to have a sophisticated job control capability which enables the user to invoke a complex series of tasks with a single command.

The software has named files complete with volume ID and extension, which is used in intrinsic file typing, the vendor said. More than 100 files per disk can be defined and the system can communicate with more than one type of disk simultaneously, a spokeswoman added.

Supporting one to four disks, Opsys 1 includes device independency so a user may freely assign I/O devices without program modification.

All files have library capability, absolute and relocatable load files may exist anywhere on a disk, she noted.

Dynamic buffer allocation provided by the system "means the user has more memory for his program," she said. Buffers are set up at execution time from the top of memory and overlay the loader, they are relinquished as files are closed.

Modular in design so only those features that are desired need be present, the entire Opsys 1 fits in less than 3.5K of memory, the vendor said.

The system, on paper tape or diskette, is available now for $700 from Systems Pro Tem, 3206 E. Laurel Creek Road, Belmont, Calif. 94002.

Our 3270 replacement: It's more than you bargained for.

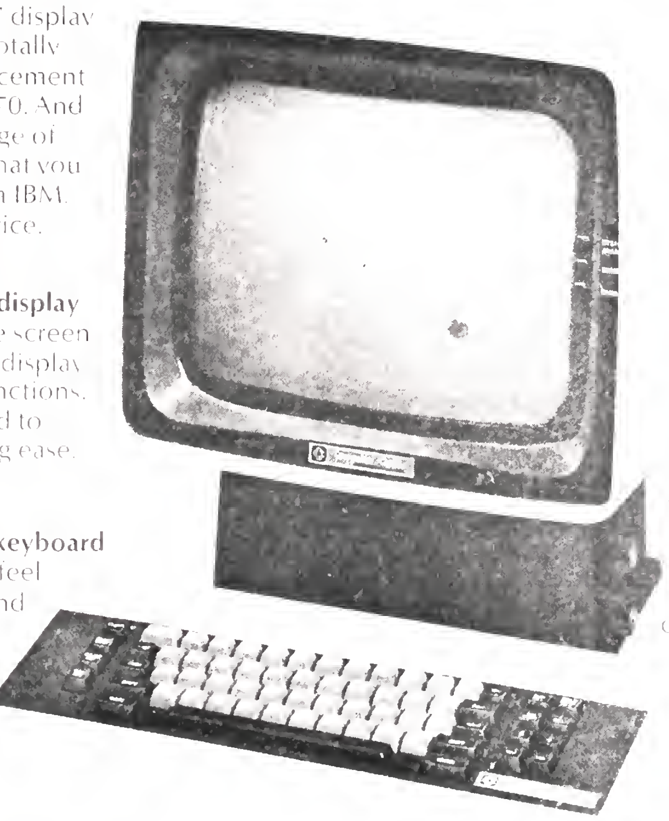
A 45% cost saving is a bargain. But Computer Optics offers more. The CO:77 display terminal is a totally compatible replacement for your IBM 3270. And it offers a range of design features that you can't get from IBM. At any price.

Fast 60-cycle refresh rate for a sharper steadier image and reduced operator fatigue.

Large 15-inch display with a non-glare screen and a constant display of all system functions. It's designed to ensure viewing ease.

Moveable display housing that tilts to the individual operator's best viewing angle. It means increased comfort for the operator and increased productivity for you.

Touch sensitive keyboard lets operator feel each keystroke, and helps reduce errors.



Computer Optics Inc.
Berkshire Industrial Park, Bethel, CT 06801

Software Cooperative Endangers Users' Market Edge

By Lewis L. Copley Jr.

Special to Computerworld

Concepts and Techniques

In "Cooperative Development of Software Seen Better Than Current Approaches" [CW, June 14], Constable painted an amazing collage of illogic based upon inaccurate assumptions and factitious examples.

His statement that "as fast as the hardware dollar buys more, the software dollar buys less . . . and less" was both technically incorrect and historically inaccurate. In the first instance, the statement assumed a proportional relationship where none exists, in the second instance, today's software dollar buys more than it did seven years ago (let alone 10 to 15 years ago).

Examine the facts. It is acknowledged that today's hardware dollar buys more because of improved technology, manufacturing, marketing and distribution. In 1969 a 12K IBM 1406 with one 2.5M-byte disk, one printer, one reader/punch and four tape drives cost $409,000.

In 1976 a 16K multiprocessing system with two remote CRT workstations, one 5M-byte disk, one reader, one printer, one diskette and four cassette drives can be purchased for $55,000. Comparative performance to characteristics and capabilities indicate the latter system is three to five times the machine the 1406 was.

Spirit of 96%

In this example (albeit extreme), the cost of hardware decreased 96% over a seven-year period. Does software cost that much more in 1976? Could it be that, because software costs have decreased, software merely occupies a larger proportion of the DP budget?

"No" in response to the first question; "yes" in response to the second. The cost of software is mainly attributable to two factors – salaries and time.

Depending upon the levels of expertise, DP salaries have increased 35% – 100% during the seven-year period of 1969-1976, with a 48% median. The majority of this increase can be laid at the doorstep of a double-digit, inflationary economy, the remainder to competitive salary practices.

However, during the same seven-year period, productivity aids (like on-line programming and interactive debugging) have dramatically reduced project development time (e.g., turnaround time has been reduced from days to minutes). Measurements have indicated 60% to 140% productivity increases.

Because the cost of software is derived from salary/time interaction, the net effect is that today's software dollar buys 12% to 66% more than it did just seven years ago.

To "look at the 10 largest banks, insurance companies, etc. [and] find that, apart from names and locations, their products and services are almost identical" – as Constable did – requires tunnel vision. This is a fallacy of composition similar to:

Mary likes trees.
A canary likes trees.
Therefore, Mary is a canary.

Cooperative Concept Doomed

To suggest that industry giants attain their stature via a program of mime is absurd. There are a number of reasons why the top 10 corporations in any industry reached that position, including strong leadership, sound investment policies and successful market strategies.

It is precisely these qualities that doom the cooperative software concept.

Contrary to what Constable might lead one to believe, a large corporation's software (aside from personnel/payroll, general accounting and purchasing/inventory, a mere 2% to 3% of total software) is specifically oriented to product/service or investments. What effect would cooperative development have on the corporation?

For a long time it has been acknowledged that new product/service lead-time in the marketplace can be extremely profitable. To offer a new product/service in the marketplace presupposes the existence of support for that product or service, including the requisite software. Cooperative development of this software would be tantamount to broadcasting corporate market strategy.

Likewise, an investment portfolio yielding 1% to 2% more than the industry average is not to be considered lightly.

Not a 'Luxury' Option

Anyone who sincerely believes the 10 largest corporations in an industry pass around investment practices and market strategy is terribly mistaken. The in-house development of software is not a "luxury for which large companies are willing to pay ad infinitum"; it is, rather, a very positive way of assuring a large corporation it can retain its top ranking.

The cooperative approach calls for the abdication of those corporations at the top to a state of mediocre unanimity.

"How do you convince people that cooperatively developed (and therefore, to some extent, standardized) business applications are viable?" Constable asked. I submit you cannot. The price is too high.

Where is the economy in saving $2 million in software development while losing $50 million to $100 million in the marketplace?

Copley is with the Computer Systems and Services Office, Prudential Insurance Co., Roseland, N.J.

APO
A NEW IDEA FROM
CHARLIE & GEORGE

THE ONLY VS PAGING OPTIMIZER THAT DOES IT ALL– AUTOMATICALLY!!

Excessive paging. It's a curse that settles around programs when your system changes from real to virtual storage.

The programs you have weren't designed for VS. And, frankly, new programs are designed to do a job. They're not specifically designed to have low paging.

Excessive paging and inefficiencies lead to higher system overhead. That's not what you had in mind when you went to VS.

APO(an automatic paging optimizer) is a new product designed to get you out of this dilemma—effortlessly. It reduces the paging overhead to a level you can live with.

APO produces paging improvements up to 91%. And it *automatically* restructures the program.

Without any reprogramming effort on your part, the program's paging and working set has been optimized.

APO works on all types of programs: proprietary programs, TP systems, compilers, and anything else that contributes to a paging overhead.

High paging is the flag that tells you where APO can save you money.

There's a lot more we can tell you about APO. You can get it in writing or over the phone. Call or write Boole & Babbage Inc., 850 Stewart Drive, Sunnyvale, CA 94086, (408) 735-9550. Just tell us you believe in automation and low overhead.

Boole & Babbage
GEORGE CHARLIE

George & Charlie, I've got a paging problem and I'm a true believer in automation and low overhead. Send me more information on APO so we can optimize our VS paging—*automatically!*

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Title ______
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Street ______
City ______ State ______
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System ______

Assembler Leaves Choice Of Host, Target to User

ATHENS, Ga. – Described as a cross-assembler with a high degree of machine independence, the Meta Assembler from Cosmic "can be used on any host computer with Fortran IV capability and a word size of 32 or more bits," the clearinghouse said.

For any given use of the package, the host configuration is defined at assembly time. The software can produce object modules for any target CPU through parameters also defined by the user at assembly time, Cosmic noted.

Written in Fortran IV and intended for use in batch mode, the package includes "approximately 16,006" source statements. It is cataloged as MFS-23449/CW and is available for $1,590 (documentation costs an additional $21) from Cosmic, 112 Barrow Hall, University of Georgia, Athens, Ga. 30602.

Firm Decides Against CPU Upgrade

Paradyne PIXs Cure Drug Wholesaler's Workload Ills

By John P. Hebert
Of the CW Staff

NEW YORK – An independent pharmaceutical supplier here was forced to make a decision between modifying the communications portion of an order entry system or making a costly upgrade to a larger mainframe when additional processing requirements of a company division pushed it into a full second-shift operation.

Commons Bros., Inc., chose to install one of the first Paradyne Corp. PIX II Parallel Interface Extenders rather than upgrade from its IBM 370/115 Model 1 to a Model 2, according to John Ferrick, DP manager at the wholesale drug firm.

The 370/115 mainframe was Commons' introduction to computerized order entry procedures. It was installed in March of 1975, along with eight IBM 3277 terminals and other peripherals.

The CPU ran under DOS/VS and the Distribution Order Entry System (Does) developed by Lag Drug, Ferrick said. Commons modified the Does package to support its central warehouse in Manhattan, which went on-line in September 1975, and County Drug, a company division in the Bronx.

This completely computerized Commons' hospital contract billing system, he said.

Last February, County Drug became fully supported by this system and orders for druggists' supplies were pooled at the central location.

Workload Degraded CPU

With the additional transactions, paging and core requirements associated with the Bronx division, however, Commons experienced "serious degradation" of the mainframe's ability to handle the workload, Ferrick said.

Power/VS overhead on the system was taking about 40K of the 192K real storage and 172K of the 512K virtual storage in the machine and throughput really went down, he recalled.

Common decided the optimum configuration would have to reduce the system paging rate, increase printer speed and decrease the printer forms changing at the central site during critical billing periods.

"Paradyne was able to solve all the problems," Ferrick said, including allowing the firm to stay with a 2,400 bit/sec half-duplex private line between the Bronx and Manhattan facilities rather than upgrading to a 9,600 bit/sec full-duplex line.

The PIX II units operate under IBM's Synchronous Data Link Control (SDLC) with a "very efficient line utilization. We get about 4,800 bit/sec performance because of the data compression methods utilized by the units," he said.

The IBM Integrated Communications Adapter (ICA) was not able to offer the same kind of data compression, he added.

After installing the local and remote PIX II units, Commons was able to replace 300 line/min IBM 5203 printer and 300 card/min IBM 1442 card reader with Paradyne 300- and 600 line/min printers and a 600 card/min reader at the central location, he said.

At the remote warehouse, an IBM 3774 terminal emulating a 2770 was eliminated. Commons had "horrible problems" with the 3774 before it was removed, Ferrick said.

Relatively slow line printer and card reader peripherals were replaced by faster, 300 line/min Paradyne devices, he added.

Time and Dollar Savings

Connecting one PIX II unit to the multiplexer channel of the CPU and installing the Paradyne peripherals brought both time and dollar savings, Ferrick said.

First, there was no need for IBM's ICA or the remote teleprocessing portion of Power/VS. This represented a savings of 22K real storage and 48K virtual storage, he said.

Secondly, Ferrick continued, Commons was able to keep the 2,400 bit/sec line to support the higher speed peripherals at the central and remote sites.

"We were able to increase our local device speed and almost completely eliminate the need for forms changing since one printer was dedicated during the day to the invoices," he said.

Additional Storage Released

Beyond these benefits, the additional storage released from the Power/VS partition allowed the drug wholesaler to reallocate the real storage to the billing partition, enabling the shop to run most of the batch jobs and billing system in real mode, he said.

"This radically reduced the system's overall paging rate and reduced the elapsed time of the invoicing operation from 20 minutes to six minutes.

"The overall operation time was cut by four hours due to the sum of all these savings, representing a 25% savings in total system throughput," Ferrick said.

PIX II support at Commons has been extended beyond unit record devices, allowing the company to add more IBM 3277 CRT terminals at the Bronx location without modifying the current local order entry system, he said.

The PIX II system was up and running 30 days after it was ordered, he said, adding the addition cost was $2,400/mo – almost the same cost of the peripherals and other devices replaced.

The other alternative didn't pose much competition for the one chosen, Ferrick noted. There was an eight-month wait for an IBM 370/115 Model 2 and it also would have been very expensive, he said.

Bell DP-Oriented Transaction Service Okayed

By Ronald A. Frank
Of the CW Staff

SEATTLE – Pacific Northwest Telephone Co. has gained experimental regulatory approval here for a DP-oriented communications service designed for banking and other functions.

Called Transaction Network Service (TNS), the Bell offering will include a polled version of the AT&T credit authorization terminal to be called the Transaction III Terminal.

The switched service will operate over Bell dial-up lines and will convert asynchronous signals from the terminal into binary synchronous data format for entry in a CPU or terminal to be supplied by the customer.

Under the experimental TNS tariff, noncarrier terminals can be interfaced by the customer. At a recent conference, Bell representatives explained TNS will use Ascii data link protocol based on the Ansi X3.28 standard. Although similar to the standard, the as-yet-unnamed protocol could provide some interfacing difficulties, according to a spokesman for an independent terminal supplier.

The TNS offering allows messages to be transmitted up to 128 characters. The service is controlled by a TNS switch which is a modified version of the Bell ESS 3A. This switch looks at each inquiry initiated at a customer terminal and checks parity, longitudinal redundancy and that the terminal is authorized to access the DP center.

Two types of TNS are available in polled or nonpolled mode. The polled sequence operates at higher speed and includes the Transaction III Terminal which does not have a telephone handset and which accepts only answers which can be displayed on the LED display.

On the low-speed side, a Transaction I or II telephone or Touch-Tone phone can be used with answer-back, tone answer or low-speed data at 150 bit/sec, AT&T said. Both service types can be used with noncarrier terminals.

The access line between the TNS switch and the customer DP center can operate at 2,400-, 4,800- or 9,600 bit/sec. In addition, CPU-to-CPU inquiries can be handled, but messages over the TNS cannot exceed 128 characters in length.

The cost of each message is based on a Transaction Message Unit which is priced at $.001 plus five message units up to 32 characters; six message units from 32 to 64 characters; and seven message units from 64 to 128 characters. The dial-up low-speed capability also includes a holding time charge of $.0012 for voice or tone answer-back and $.0006 for data answers (150 bit/sec).

Messages initiated by the Transaction I, II and III are initiated by plastic magnetic stripe cards that conform to American Banking Association standards, but messages can be initiated manually from Touch-Tone phones or other customer-provided terminals.

The Northwest Bell tariff states that the customer has the responsibility of subscribing to "an adequate number of access lines to handle message volume. Failure to do so will result in inquiries being turned back to the point of origin."

At present the TNS service has been tariffed only by Northwest Bell and is due to expire on June 1, 1977, unless extended. There are no TNS customers yet, but the first in the Seattle area is expected to be in operation by the end of the year, an AT&T spokesman said.

In addition to banking, the TNS offering is designed for reservation systems, quotation services, library retrieval and others, a spokesman said.

Raytheon Has Reader For PTS-100 Badges

NORWOOD, Mass. – A security badge reader for use with Raytheon Co.'s PTS-100 programmable terminal system has been introduced by the company.

The Model 6140 reader was designed for system entry and security applications with Raytheon's IBM 3270 emulation program and is used on a one-to-one basis with each display terminal in a network, the company said.

The device accepts a perforated plastic card which can be precoded with up to 14 digits of numeric information that identifies the operator as well as the level of data for which clearance can be obtained, it said.

The Model 6140 costs $750 or $35/mo including maintenance on a one-year rental. Volume discounts are available on a purchase-only basis, the spokesman said from 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

Let's talk about a brand new Terminal

Here it is! The *new* AJ 832. This new printer terminal combines high speed with versatility, reliability, and operating convenience. There are plenty of features as well, for example:

- A 256-character buffer memory
- ASCII, EBCD, and Correspondence Codes in one
- 30 or 45 cps throughput
- 17 key numeric pad with programmable function keys
- High speed plotting and plotting software, too
- APL keyboard

There are many options available too, such as pin feed platen or forms tractor, side shelves, and fan-fold paper trays.

We have a nationwide sales and service organization to stand behind every new AJ 832, and you have the choice of purchase or lease (month-to-month if you wish).

We'd like to talk about everything this new AJ 832 has to offer. We'll start by sending you our brochure. Just fill in the coupon or give us a call direct.

Marketing, Dept., Anderson Jacobson, Inc.
1065 Morse Ave., Sunnyvale, CA 94086

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Terminal Transactions

Guide Details 130 Teleprinters

PENNSAUKEN, N.J. – Auerbach Publishers, Inc.'s 166-page *Guide to Teleprinters* covers the major features of more than 130 devices to help business communications users evaluate and select printing communications terminals.

The guide offers detailed descriptions of 35 major terminals, including the manufacturer, price, product features, limitations, competitive performance, compatibility and maintenance characteristics, Auerbach said.

In addition, the soft-cover booklet contains a product class report covering the teleprinter marketplace, technological advancements, system design, selection guidelines and future trends.

The guide notes, for example, that an estimated 200,000 teleprinters are in use today and Teletype Corp. products account for about 50% of these, while IBM Corp. has another 26% with its 2740 and 2741 and the recent 3767 series.

For these reasons, according to the guide, Teletype and IBM have forced other manufacturers to make terminals compatible with their offerings and this compatibility "has almost reached the position of being an absolute requirement."

The publication also predicted "the impact of IBM's Synchronous Data Link Control (SDLC) will certainly be felt by all IBM users and, in fact, by the entire data communications industry."

The *Guide to Teleprinters* costs $24.95 from Auerbach at 6560 N. Park Drive, Pennsauken, N.J. 08109.

Harris DMA Multiplexer Accepts Eight Lines From RS-232 Units

FORT LAUDERDALE, Fla. – Harris Corp.'s Computer Systems Division has introduced a microprocessor-controlled multiport dedicated communications I/O channel said to be capable of accepting up to eight asynchronous lines from terminals or modems.

The Series 8400 direct memory access (DMA) communications multiplexer operates under the control of an 8-bit microprocessor, Harris said.

It concurrently controls the character-level protocol, error checking and buffer maintenance of each port at aggregate data rates up to 76.8 kbit/sec or each line at transmission speeds of 9,600 bit/sec, Harris indicated.

The asynchronous line interfaces are configured in pairs; each has its own parameter stack, vectored priority interrupt and word assembly/disassembly buffers to operate independently of the other, the company noted.

The DMA multiplexer is installed in an I/O channel slot and interfaces directly to the memory buses in the CPU backplane. It operates on any Harris computer and is supported by both DMS and Vulcan operating systems, the company said.

Four port types are available on the Series 8400 multiplexer: a 20mA port for teletypewriters; an RS-232C port for RS-232 terminals; an RS-232C modem port for Bell-compatible modems; and a differential port for all Harris CRTs and terminals.

The basic multiplexer is standard on all S100 and S200 systems; the price for addition of ports to these multiplexers is $550 for each twin port, Harris said.

A Series 8400 with four asynchronous ports for any of the company's Slash computers is $3,900. Harris can be reached at 1200 Gateway Drive, Fort Lauderdale, Fla. 33309.

Datatrol Device Links Banks With Retailers

HUDSON, Mass. – Datatrol, Inc. has a terminal system designed for use by banks wishing to provide authorization services to its retail merchant customers.

The FT32 reportedly provides a system for on-line check cashing, credit-card authorization and electronic funds transfer transactions. It is available with or without a magnetic stripe card reader and an optional personal identification number (PIN) pad.

The terminal allows customizing of graphics including its 10-digit LED display, its 16-button keyboard (numeric keys plus six functions) and its 12-window message indicator panel. It incorporates an LSI microprocessor, allowing it to operate without a local controller, Datatrol said.

Where direct connection is not required, the unit can be configured into a network including Datatrol concentrators. Within such a network, FT-32 units can be clustered in groupings and be served by the Datatrol concentrator.

A minicomputer which serves as a store-and-forward center polls the network and interfaces directly with the bank's CPU or front end, a spokesman explained.

Supporting firmware is available for the FT-32. Communications control, terminal control and control of such applications as check guarantee and validation processing are provided in a software package.

Conventional communications disciplines are used to minimize the programming requirements of the central computer facility, Datatrol said.

The magnetic stripe card reader has no moving parts and meets the 1972 Track II American Banking Association specifications. It can recover stripe data at speeds from 4- to 35 in./sec and compensates for interbit variations as high as 25%, the firm said.

The optional PIN pad is equipped with 10 numeric entry keys and an "Enter" and "Clear" key.

The basic FT-32 costs $700, the magnetic card reader is $200 and the PIN pad costs $90. First deliveries are scheduled for late 1976 from Datatrol, Kane Industrial Drive, Hudson, Mass. 01749.

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TI 725 Terminal	1,695.00	89.95
Beehive Super Bee CRT	1,500.00	84.95
Techtran 4100 Datacassette	950.00	54.95

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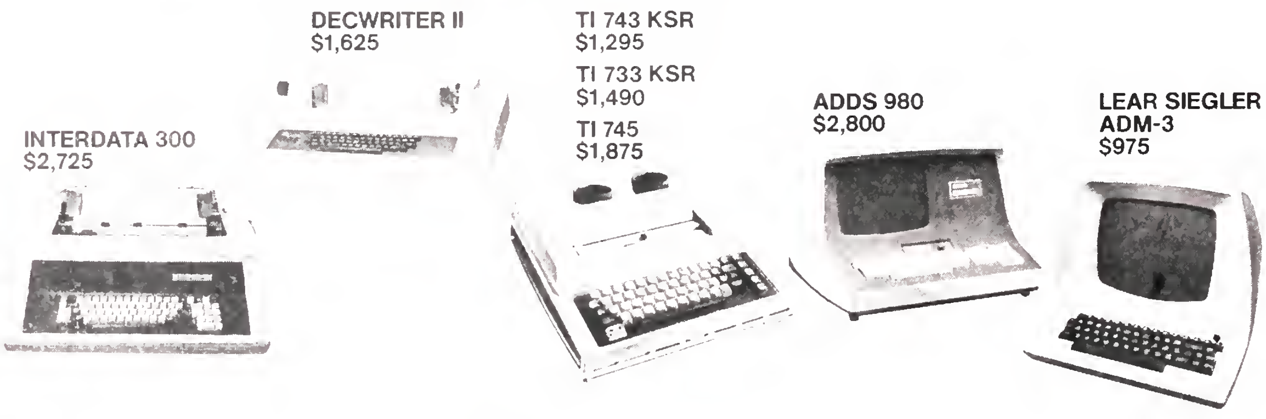

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Insurance Agency Switches to Multiterminal System

PORTSMOUTH, Ohio – A group insurance agency here has replaced its unit record equipment with a multiterminal, shared data entry and concurrent processing system.

In the process, the company has had to convert more than 15 years' accumulation of punched cards and is completely eliminating extensive rows of tub files containing active client index cards.

The punched cards were converted to magnetic tape by a Sycor, Inc. Model 340 terminal with flexible disk option and a 250 card/min card reader. As the cards were run through the reader, they were edited for out-of-range conditions, displayed on the terminal's screen for review, batch balanced and spooled to magnetic tape for processing on an IBM 3.

The process has taken nearly 10 months, according to Charles Herrmann, general manager of Daniels-Head & Associates, Inc. "We can now know exactly what plans and amounts of insurance a client has in force – the premiums, special riders, any claims or applications pending – and we know it immediately," he said.

"That was the weak link in our control," according to Herrmann, whose firm specializes in developing insurance programs for state and national organizations such as the American Optometric Association and the Association of Trial Lawyers of America.

"The problem was that we have so many clients who carry several policies within the various group programs that we had trouble consolidating the file information for their different coverages. In fact, it could take several days to locate information to prepare coverage status reports."

That was compounded by the fact keypunching was a centralized operation with all user departments sending the source documents to it. "Occasionally, if a client wanted to know the status of an application, the source documents would be in transit and we couldn't supply the correct information on the spot," Herrmann said.

When the coverage information was available, a synopsis was stored in an enormous tub file of index cards, but since Daniels-Head clients often carry several policies, it required a clerk looking in all the group policies under which a client could conceivable be insured.

Daniels-Head now uses a 20M-character "electronic tub file"' resident on its Sycor 440 clustered terminal processing system to store coded master file information that used to be stored in boxes of punched cards at the company's Portsmouth headquarters.

Individual client names are set up with identification numbers based on their name and birth date. Accessing them is a matter of keying in the correct code number on one of the system's eight video display stations.

The name and all qualifying information flashes on the 576-character display screen (and may subsequently be printed out on the attached 60 char./sec printer) within seconds, compared with the hours or days it took under the manual system.

Rate changes and other across-the-board changes are also done electronically by entering the change for each age-group bracket and having the system adjust the individual records for the entire group.

The problem of knowing the current status of a policyholder is also eliminated by having video display stations in the user areas – accounting, underwriting, incoming applications and claims (instead of a central keypunch section) – all of which can access the common shared disk.

The user groups now enter their own information, instead of sending the source documents to a central keypunch section. "That way we are sure the status report of a client is up to date because there are no documents in transit," Herrmann said.

"And all entered information is checked by the terminals for completed fields and out-of-range conditions," he added.

The Sycor 440 has significantly reduced the company's reliance on its IBM 3, according to Herrmann, and is also being used to edit and accumulate batch totals on general accounting information which is then transmitted to the 3 where the corporate ledgers are maintained.

The Sycor 440 is also being used in the Daniels-Head direct mail operations where names and addresses are maintained on magnetic tape for the groups and associations which vary in size from several thousands to over a quarter of a million members.

Selected names for a mailing campaign are then spooled on the Sycor 440 in a four-up address label format and are then printed off-line using the company's Model 340 terminal with its flexible disk option and a 600 line/min printer.

With the Sycor 440-centered system, Daniels-Head has all the advantages of a large centralized system and then some, according to Herrmann. "Competitively, we have the ability to provide home office functions locally and can now react more quickly to the demands of our clients."

Short-Haul Modem Bows at Bo-Sherrel

NEWARK, Calif. – The M-1 shorthaul modem from Bo-Sherrel Co. is intended for asynchronous transmission with EIA RS-232 and CCITT V-24 interfaces.

Transmission speeds handled by the device in short-haul configurations in maximum distances from two to 10 miles are 600- to 9,600 bit/sec, the company said.

The M-1 modem is priced at $149 with delivery normally in four weeks, Bo-Sherrel said from 36443 Shelley Court, Newark, Calif. 94560.

Monthly Newsletter Bows

RAMSEY, N.J. – A monthly newsletter describing common carrier and regulatory events of interest to telecommunications users has been introduced by the Center for Communications Management.

Called *This Month in Telecommunications*, the publication reportedly will also cover reference and research features. Regulatory issues at the state level and positions on current issues by outside contributors will be included.

The newsletter costs $75/year from the center at 79 North Franklin Tnpk., Ramsey, N.J. 07446.

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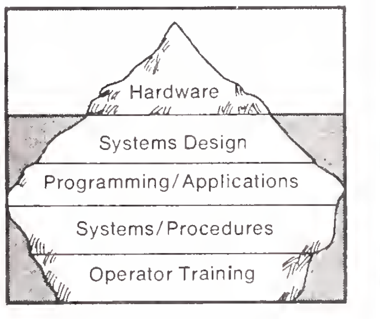

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Bits & Pieces

Technocadimum Selling Time On New York Univac 70/35

NEW YORK – The Rent-a-Computer Service Center run by Technocadimum Data Corp. here in mid-town Manhattan has time available on a Univac 70/35 and is renting it for $10/quarter hour of wall clock time.

The system has a 64K main memory, six tape drives but no disks, a spokesman said. It operates under TOS and is generally available after 3 p.m. and through the second shift, he added.

Recognizing some users need more than 15 minutes of wall clock time to complete their work, Technocadimum President William Hastings said longer rentals "would probably be discounted heavily. I think an hour, for example, might cost only $25 or so."

In addition to providing computer time, the center is planning a number of seminars and short courses in programming and computer science. Each seminar is expected to last one to three evenings and cost less than $20, a spokesman noted.

Technocadimum – and the service center – is at Suite 707, 101 Park Ave., New York, N.Y. 10017.

EPI Has Speed-Tolerant Recorder

ENGLEWOOD, Colo. – Electronic Processors, Inc. (EPI) has announced the availability of an OEM speed-tolerant cassette recorder for use in minicomputer, microcomputer, controller or other systems requiring remote-controlled tape drives.

Performance for the STR-100 was rated by the firm at over 100M bits without an error. The unit accepts asynchronous 8-bit parallel data words, using standard TTL levels with switch-selectable polarity, EPI said.

The data transfer rate is asynchronous up to 125 char./sec, according to EPI.

The STR-100 is priced at $699 in small quantities from the firm at 1265 West Dartmouth Ave., Englewood, Colo. 80110.

Unit Converts Disk to Tape

CHICAGO – The Insta-Disk floppy disk converter from Bank Computer Network Corp. (Bankcom) converts data from disk to tape and vice versa, according to its vendor.

Insta-Disk records data from IBM 9-track magnetic tape onto floppy disks or transcribes the data from up to three floppy disks at a time, sequentially, onto IBM magnetic tape, Bankcom said, adding all data is verified automatically during transcription.

Insta-Disk enables the floppy disk user to communicate directly with the computer via disk-to-tape conversion.

Data from one disk can be transferred to another for file copy use; data from the same disk can also be duplicated on multiple disks, it added.

Data can also be transmitted from one diskette to another, from disk to tape or from tape to disk via phone.

The Insta-Disk permits editing by logical record and field according to user or vendor programs; the unit also permits "surgical formatting" of single sectors to save data on damaged tracks without injury to other sectors on the track, Bankcom said. It is said to be IBM 3740 format-compatible.

Insta-Disk uses a microprocessor and features built-in diagnostics, Bankcom said. It is available for $15,000 or $200/mo from the firm at 333 N. Michigan Ave., Chicago, Ill. 60601.

No Great Program Changes Needed

Upgrade From IBM 3 to 370 Called Easy

By Don Leavitt
Of the CW Staff

MONTREAL – Users can convert from an IBM 3 to a 370 and bring most of their programs along virtually intact without a great deal of effort, according to an IBM systems engineer who has been through the process with a number of clients.

Speaking to a technical session at a recent meeting of Common, a group of small IBM systems users here, however, Richard Zonghetti said there are some language differences and some systems incompatibilities that could make the changeover awkward if they aren't recognized ahead of time.

It is essential to put together a checklist of everything that must be done and all problems that are expected and to have this list before any conversion is started, he said. Later he distributed an example of such a list.

One of the areas in which there are "very dramatic differences" between the 3 and the 370 under DOS/VS is in disk organization, Zonghetti said, noting, for example, that users cannot dynamically allocate file space on a 370, as they may on the 3.

The 370 approach also differs from the 3 in supporting fixed block sizes and the use of expiration dates, instead of a RETAIN option, to protect files from premature destruction, he added.

Among the potential coding problems, Zonghetti cited random retrieval of a sequentially organized file. The System 3 disk RPG-II can manage this through use of a relative record number and the CHAIN operation code, he said.

But DOS RPG-II does not support the use of relative record numbers with sequentially organized files, and a diagnostic will appear if this technique is attempted. To get around this problem, Zonghetti urged users to convert all sequential files which are randomly processed to index sequential format.

The same type of problem arises when adding records to a sequential file. "By some strange little quirk," System 3 RPG-II permits this type of operation; DOS RPG-II does not. Again, the solution normally would be to convert sequential files to index sequential and add records with successively higher keys, Zonghetti said.

An alternative method would be to sort the records to a sequence and then merge them with the sort/merge program, he said.

The set of rules for file names is still another place in which System 3 and DOS RPG-II disagree. They each allow eight character names, but the operating system on the 370 requires names to be unique within the first seven characters. "If you run into this in moving to the 370, change the name: that's all you can do," he said.

In still another instance, System 3 disk RPG-II allows the printer to skip to a line number on the user's form; DOS RPG-II skips to a channel number on a carriage control tape. The procedure to get around this is to convert all skipping entries from line numbers to channel numbers, and be sure to have a carriage tape with corresponding holes, Zonghetti said.

Although "conflicts" exist between the two systems – even though each is labeled RPG-II – there are a number of programs around that may smooth the conversion effort. In particular, IBM has a number of Field Developed Programs (FDP) that can help, he said.

CPU Helping Researchers Study Cancer Incidence in 'Ideal Lab'

HONOLULU – Researchers at the University of Hawaii here are developing computerized population records of the Hawaiian Islands to help identify groups with a high risk of cancer incidence.

They believe this may lead to a reduction in both cancer incidence and mortality through preventive measures. Hawaii provides an "ideal laboratory environment" for the study because the islands contain many different racial groups that are relatively immobile, a spokesman explained.

The researchers use the university's IBM 370/158 to maintain genealogical records of cancer patients and provide a large statistical base for the project. Security codes restrict access to the data to the medical research teams.

"We are comparing various racial groups and sectors of the population and analyzing their demographic characteristics," according to Dr. Lawrence H. Piette, executive director of the Cancer Center of Hawaii. The center, with financial support from the National Cancer Institute, was established at the university to launch research programs into the causes of cancer.

"We entered information on school children into the IBM system by blood grouping and by heights and weights at different ages," Dr. Nabil Rashad added. "This may be useful in determining what effect nutrition has on cancer," the genetics professor and acting head of the Cancer Center's data and computation unit explained.

Tall and heavy women seem to be more susceptible to breast cancer than slighter females, Rashad said. The computer studies may help determine if this is a genetic profile formed early in life; if so, these women will be urged to change their diets and life styles.

The researchers also use the computer to link publicly recorded events involving the same individuals, such as births, marriages and deaths, to form personal histories. They try to construct family trees by relating people through descent and marriage.

"Other factors, such as genetic background, also may play a significant part in the causes of certain types of cancer," Piette said. "We are studying immigrant groups and their descendants in Hawaii and the same ethnic people in their native countries in an attempt to determine differences in cancer incidence and mortality."

ICN Offers Negotiation Seminars

WINTER PARK, Fla. – International Computer Negotiations, Inc. (ICN) is offering to present a seminar on computer negotiations to user groups and other professional organizations.

The firm will tailor the seminars to meet the needs of the requesting organization, according to ICN President Joe Auer.

Topics covered include assembling the negotiating team, determining requirements, equipment and financing alternatives, planning and implementation of negotiations, he said.

As a first step, financial, contractual and contract administration objectives should be established, he said.

ICN reviews how negotiating teams, which can consist of DP, legal, financial and top management personnel, operate.

It also looks at how to determine the user's negotiating requirements, such as survey techniques to collect the data needed.

Priorities should be set on objectives and then parameters on each factor, he said.

In looking at alternatives, ICN reviews advantages and disadvantages of new vs. used gear, multiple vs. single-source vendors and how to analyze rent vs. lease vs. purchase, he said.

Other steps to be considered before the user negotiates are the limits of authority of the negotiating team, the groundrules and rehearsals before meeting the vendor.

Negotiating strategies applicable to hardware, software, maintenance, third-party leases and third-party suppliers are also reviewed, he said.

ICN also discusses how to build an administrable contract and how to administer it, as well as what recourses are available to resolve problems that might arise.

The firm, which provides contract negotiations for DP users, will conduct the seminar for the cost of its expenses. Contact Ken Brindle, vice-president of marketing, at P.O. Box 364, Winter Park, Fla. 32790.

Audio Response System Available

TROY, Mich. – A solid-state multiplexed audio response system has been introduced by Federal Screw Works' Vocal Interface Division.

The Votrax LVM-50 provides multiline audio output and Touch-Tone input handling capabilties for a range of business machines including microcomputers, minicomputers and large mainframes, the firm said.

A 16-line, 32-word system can be purchased for about $1,000/line, which means "a host of Touch-Tone audio response applications are now technically and economically feasible for business minicomputer users as well as others," according to a spokesman.

Features include variable word and message length; custom vocabulary consisting of words, phrases and the voice of the user's choosing; support of a number of audio response data sets including the Vocal Interface Audio Response Modem, Bell 407A, Bell 407B and several commercially available 403-type units; and full-feature support of the Bell Transaction Telephone, Automatic Call Distributor and Call Directors.

The LVM-50 is said to be simple to install and operate. This is made possible by use of microprocessor technology.

Because of this built-in intelligence, the system controller can simulate the operation of an asynchronous terminal (RS-232C) on the host computer's communications port, he said.

The unit is available from Federal Screw's Vocal Interface Division at Suite 102, 500 Stephenson Highway, Troy, Mich. 48084.

Allows More Time for Selling

System Frees Insurance Agents of Accounting Chores

BIRMINGHAM, Ala. – An insurance company here developed a computer-based Field Accounting System (FAS) which frees its agents from accounting chores so they can devote more time to actual selling and the enlargement of account portfolios.

Prior to FAS, Southern Life and Health Insurance Co. agents carried thick collection books with insert pages to record on one side information on the individual or family policies in force and on the reverse side to log in premium payments.

"This system left the agent with a considerable amount of bookkeeping work balancing accounts and preparing information on policy changes for the home office," the company said.

"In formulating FAS, we wanted to design a system based on our size, geographic location and the financial position of the company. We were also seeking methods of reducing the relatively high turnover rate for agents by making their job easier," Jimmy E. Phillips, actuary for Southern Life, said.

FAS was designed in-house on a Univac 90/30 computer, which the company recently installed to replace an IBM 360/20.

The card-oriented IBM 360/20 had limited capabilities and would have been unsuitable for implementing the applications needed for FAS, Phillips said.

FAS, which is written in Cobol, has been running in two of Southern Life's 45 district offices for the last 10 weeks, and all district offices should be included in the system by mid-1977, Phillips said. The result will be centralized control of operations in the home office.

Ruled Out Terminals

Initially, the company is using a courier service to pick up material from the district offices on Friday and return the processed data Monday morning.

"For the time being, we have ruled out terminals because of the high costs involved, but at some future time, with data line costs going down, it may be more convenient for us to shift to a terminal operation," Phillips said.

The computer is used to prepare two copies of route lists weekly for each agent, listing all persons on the agent's route with their address, family group numbers, premiums to be collected and any special comments about the account such as the best time to collect. In the last column of the list, the agent records the premiums he received during the week.

There is also a Family Group record which gives detailed information on the policies held by each account on the agent's route. On the reverse side of this document, the agent records payments and the dates received and gives one copy to the customer as a receipt.

Another document generated by the system is a premium collection form that identifies customers by number, name, the amount of premium and the mode of payment. The agent marks this document to record payments received, and an optical reader scans this information and updates the account records stored in the data base.

Under FAS, the computer constantly monitors due dates for payments and automatically lapses family groups for nonpayment of premiums. It also balances premium collections reported by the agent with the cashier's report.

Individual three-section weekly activity reports for each agent are produced showing a reconciliation of collection activity.

One section of the report shows any discrepancies produced from checking the agent's reports with those from the cashier. The second section summarizes activities for the week and shows any arrears, and the third section reports the caliber of policies written by the agent, analyzing business over various time frames.

The district manager receives a summary of the report covering those agents reporting to him and regional vice-presidents receive a summary for all district offices under their control.

Benefits to Outweigh Costs

Although implementation of FAS has been an expensive undertaking, "it's a must and we are going to put in a first-rate system which we have developed on our own," William R. Lathrop Jr., president of Southern Life, said.

"The benefits will eventually outweigh the costs," he added. "We'll have the exact status of every account at our fingertips, and our management people will have a better, more precise picture on which to base their decisions," he said.

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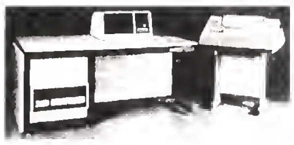

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Planning, People, Practice Seen Key to Smooth Switch

By Don Leavitt
Of the CW Staff

MONTREAL – Three key elements of any successful conversion are planning, people and practice, according to William F. Kluckas, worldwide systems and procedures manager for E.R. Squibb & Sons, Inc.

One of his units shifted from a card-oriented IBM 3/6 to a cardless 3/8 earlier this year, he told a recent meeting here of Common, a group for small IBM systems users.

Planning must be "thorough, anticipative and documented," he said, while people must be trained and supported. "And they must be given sufficient time to practice their newly acquired skills before entering the production environment," he added.

The changeover Kluckas described involved Squibb Puerto Rico which sells and distributes finished goods imported from Squibb plants in the U.S. mainland, the UK and Canada. Two warehouses – one in San Juan, the other in Barbados – serve 1,200 customers and process 950 order/mo.

There are 45 employees, three of whom are in the systems and DP department in San Juan. The 3/6, installed since June 1973, was replaced by a 3/8 this February, giving the site a "slightly bigger, much faster system at more or less the same net cost."

The "real plus," however, came from the move to a cardless environment, Kluckas said. An on-line key data entry station and an IBM 5496 Data Recorder card reader "with a speed of perhaps 22 card/min" are "no match for 3741 read speeds of 1,500 record/min," he noted.

Plan of Action

The plan of action had eight steps, the manager said. These included a moratorium on program maintenance, scheduling hardware installation, technical education and benchmarking to determine the scope of work involved and to quantify Model 8 timing improvements.

Recompiling the existing RPG-II programs and then paralleling the Model 6 and Model 8 runs was to be followed by the actual cutover. The level of support expected from both IBM and Squibb home office was also defined, Kluckas said.

The moratorium went into effect Feb. 1, with the understanding that the financial manager – the person to whom the DP function reports – could authorize critical modifications. The freeze was lifted March 1 at the completion of the changeover.

Squibb took early delivery of its first 3741 to familiarize operators with its use. In preparation for the parallel operations, an additional electrical line was activated and the Model 6 was moved to a temporary location in the computer room to make room for the 3/8.

Operator Training

Training for the 3741 operators was done through a self-study course and several half-day practice sessions. The objective was to have the DP staff completely at ease with the 3741 before it became a production machine, the manager said.

"Receiving this training unit 1-1/2 months before cutover proved to be ideal timing," he commented. "Any later would not have allowed enough learning time; any earlier would have given too much."

Meanwhile the DP supervisor took a two-day course on the programming and internal aspects of the 3741 and received hands-on 3/8 training during Squibb's benchmark effort. This was supplemented by in-house training for all three DP staffers after the computer was installed.

Three RPG-II programs and one sort from the invoicing system were selected as a representative sample for the benchmark. The Model 8 reduced compile time from 47 minutes to 21; execution time from 83 to 19. Even though the test machine had a 300 line/min printer vs. the 200 line/min machine Squibb would have, "these improvements were dramatic," Kluckas said.

Program Changes

Coding modification time for the test amounted to 15 minutes a program, but that dropped to about 10 min/program later. Squibb Puerto Rico had a library of 172 RPG-II programs. Of these, 68 required "minor header, printer and input/output control card modifications," according to Kluckas.

Another 35 programs requiring minor modifications were not needed for the cutover, so work on them was deferred. Only two programs had to be entirely rewritten, he said, noting they were file maintenance runs which could receive input only from the Model 6's data entry system.

Sixty-seven programs were deleted, Kluckas recounted. They were of the one-time special request "quick and dirty" nature and no longer required, he explained. Overall, Kluckas said he was surprised and pleased at how little change was needed to convert the useful parts of the existing library.

The question of parallel processing is "always a difficult one," the speaker said, but since in this case no applications redesign was involved, "we decided to parallel, 100%, the operations for the last day of the month and the month-end processing for February." The next to the last business day was processed through the Model 6 as usual. Then all master and balance forward files were copied, creating a set of disks for the Model 8.

Transactions for the last day were keypunched, processed through the Model 6, copied to diskette and processed through the 3/8.

A comparative check of the daily results revealed "100% accuracy," Kluckas said, adding "month-end reports were also run in full parallel and again were 100% in phase, old vs. new."

IBM's 40-hour, preinstallation test allowance was "virtually unused," he said, since the vendor had only a 3/15 at its data center.

The benchmark had to be run at a customer site, and Kluckas warned his listeners to "be aware of any similar support difficulties in your area and prepare to use them as leverage in negotiating sessions."

IBM support otherwise was excellent, however, he said. So was backing from Squibb home offices. And since everyone knew what was expected of them and produced, the conversion went very well, Kluckas concluded.

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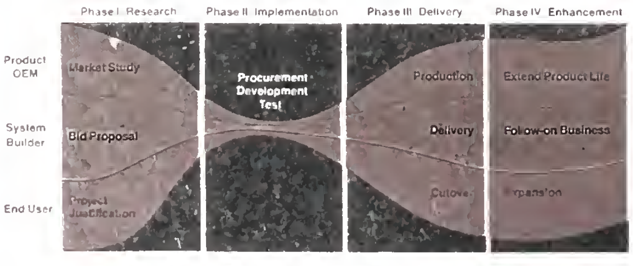

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Mini Bits

IBM Puts 3/6, 3/10 on TAP

ATLANTA – IBM announced an extension of its Term Availability Plan (TAP) to 3/6 and 3/10 CPUs and related features.

Standard rental prices will be 5% higher than those under the three-year TAP, the firm noted.

Extension of the TAP to models 6 and 10 is in line with terms for other central processors of the 3 line, IBM said.

In addition to the price differential, the TAP provides lease and purchase price protection through the first year of the term and purchase accruals for 36 months up to 50% of the purchase price, it added.

DPMA Chapter Sponsoring Show

EL PASO, Texas – The El Paso Chapter of the Data Processing Management Association (DPMA) is sponsoring the first multivendor computer show held here, it said.

The event is scheduled to coincide with the DPMA Region III International Directors meeting to be held Sept. 23 and 24, it noted.

The show is limited to minicomputer and supporting equipment vendors.

No admission will be charged, it said from P.O. Box 1894, El Paso, Texas 79950.

Mesa Two Gets Peripherals

SAN DIEGO – Two additional peripheral devices for the Mesa Two models 7000 and 9000 have been introduced by Martin, Wolfe, Inc.

The Model 0911 magnetic tape drive is an Ansi-compatible unit which accepts 10-1/2-in. reels and records data in a 9-track, 800 bit/in. mode and operates at 45 in./sec.

The tape system includes transport, read/write head, read/write electronics, control electronics and power supply.

The 0922 card reader is a heavy-duty unit designed to operate in remote terminal applications requiring fast and simple loading and unloading, the firm said.

A slant-top feature of the card reader uses the principal of gravity to allow smooth card flow for easier unloading and loading of cards while the reader is in operation, it noted.

The card reader includes control and timing electronics, Martin, Wolfe said.

The magnetic tape unit costs $18,200 and the card reader is $8,200 from Martin, Wolfe, Inc. at 9830 Willow Creek Road, San Diego, Calif. 92131.

Unit Loads PDP-11 Programs

ANAHEIM, Calif. – An interface configuration for the Datum, Inc. Model 400 universal recorder provides program loading for Digital Equipment Corp. PDP-11s, the firm said.

The paper tape reader/punch emulator consists of a standard Model 4000 and an interface controller board embedded in the PDP-11. The controller emulates the paper-tape reader, giving 1,000 char./sec read/write capability.

In operation, users may either transfer system and application programs from paper to cassette or record new programs on tape, the firm said.

The recorders are available as single-transport desktop units or as dual-transport rack-mounted units. The transports read/write at 30 in./sec, rewind at 120 in./sec, the firm said.

The single-transport system costs $3,150; the dual transport is $4,145.

Datum, Inc. Timing Division is located at 1363 S. State College Blvd., Anaheim, Calif. 92806.

Distributor to Save $125,000/Year

Four Turnkey Minis Replace IBM 370

By Esther Surden
Of the CW Staff

COLUMBIA, Md. Mid-Atlantic Toyota Distributors, Inc. here is in the process of replacing its IBM 370/125 with four dedicated minicomputers to realize an estimated $125,000/year savings, according to the user.

The firm, which is presently running in parallel on the 370, has three of the four minicomputers and their respective dedicated applications on-line. The fourth is expected to be up the end of August, according to R.W. Townsend, computer service and systems manager.

Originally the company investigated the costs involved in going on-line with IBM, Townsend said. The results of that study indicated that to add the capabilities to the IBM system would cost "65% more than we were currently experiencing" and take 2-1/2 years to implement, he said. The firm then turned to minicomputers as a possible alternative.

The minicomputer area was packed with likely systems, Townsend said, but the decision was narrowed to three companies he felt could supply the firm's special needs. These were Digital Equipment Corp., Microdata Corp. and Display Data Corp., a Maryland turnkey systems vendor.

Display Data had been in the automotive software business previously and several Toyota dealerships had used its software systems with success, so the firm decided to take a chance on the three-year-old company, Townsend said.

The four minicomputers installed at Mid-Atlantic are each dedicated to a special application. The systems can exchange data, but they do not share disk files, according to Townsend. The CPUs are also located in the same room, he noted.

The firm contracted for the minis in February and by July three out of four applications were up and running, he added.

The four systems are a financial analysis and accounting system, a parts analysis system, a recordkeeping system and a vehicle analysis system.

The financial analysis and accounting system is configured around a Microdata 1600 Model 30 CPU with 40K of memory, a disk and controller with 20M bytes of storage, three CRTs, two printers, 165 char./sec printer and a 300 line/min printer.

Applications on this system include general ledger, accounts receivable and payroll. The payroll system, although written, is still being done at a local bank, Townsend noted.

Data entry is done through two CRTs in the accounting department; that department also uses the slow-speed printer for this application, he noted.

Parts Analysis

The parts analysis system gives a total distributor parts inventory, has order entry capabilities and performs accounts receivables. Clerks enter orders and manufacturers' changes through three CRTs in the parts department. One CRT in the warehouse along with another slow-speed printer are used for entering or receiving data at the location.

This system's configuration includes the Microdata CPU with 40K of memory, 80M bytes of disk, five CRTs, a 300 line/min printer, the 75 line/min printer and one tape drive. The tape is used for file backup.

Communications between Toyota headquarters and Mid-Atlantic will be eventually implemented, but presently tape is transported between California and the distributor via the mails, Townsend noted.

The minicomputer dedicated to recordkeeping for the individual dealerships in the Mid-Atlantic area presently performs inventory control applications for dealers who choose to use the mini as a service bureau, he said.

At present, 30 of the 70 some dealers in the Mid-Atlantic states take advantage of the service. Information for this comes in through the mails and is entered in the systems department, Townsend said.

This system is expected to be expanded to include more applications and additional dealerships with CRTs being placed in every dealership that subscribes, he noted.

The present configuration for this system includes the CPU with 48K of memory to accommodate the additional files needed for 30 different dealers, 80M bytes of disk, a CRT and a 300 line/min printer.

Vehicle Analysis System

The vehicle analysis system, which will be up in August, will keep track of automobiles received at the Port of Baltimore. This system, a software package Display Data did not have immediately available for the automotive industry, is being completely rewritten from the IBM programs, Townsend said.

The equipment for the vehicle analysis system includes a 40K CPU with CRTs, a 300 line/min printer, a 75 line/min printer and 40M bytes of disk. The slow-speed printer and a CRT are located at the port and communicate with the system over 1,200 bit/sec lines, he said.

The total four-system cost was $400,000 including all hardware and software. Display Data is performing a maintenance function; each of the CPUs is connected to a CRT in the Display Data office.

Although recognizing this presents a security problem, Mid-Atlantic is trusting the vendor for the moment. A plan to have a switch so the firm will have to allow entry into the system by the vendor is being investigated, he said.

The instability of turnkey vendors is another problem Townsend recognized. He has had two programmers from his office trained by Display Data in the applications, and Display Data "has turned its total operating system over to me," he said, so that, should it go out of business, he is protected. The hardware is configured with major manufacturers' products, he noted, so service is likely to be available for them.

Added Communications Featured In ICL Top-of-the-Line System

NEW YORK A large-scale minicomputer designed as an upgrade for users with small business systems who need increased communications capabilities has been introduced by International Computers Ltd. (ICL).

The ICL 2904 is the top-of-the-line model of several compatible processors in the ICL 2903 range, the company said, and features a 50% increase in the speed of instruction execution over the 2903.

The CPU can accommodate from 128K to 384K bytes of main storage and up to 510M bytes can be stored on disk at any one time, it noted.

Three types of disks are available for the system. These include a fixed and removable disk with 5M or 10M bytes, a 30M- or 60M byte exchangeable disk and floppy disk with 500K bytes of storage capacity, ICL said.

A magnetic tape system offered with switchable 800 bit/in. NRZI or 1,600 bit/in. phase-encoded recording has transfer rates from 40K byte/sec to 80K byte/sec.

The ICL 2904 has six communications channels; ICL 2903 systems can act as satellites to a 2904 system. In addition, the 2904 can be remotely linked to a large mainframe, ICL said.

ICL 2904

Line printers from 300 line/min to 1,500 line/min, card readers, paper tape readers and punches, graph plotters and other peripherals are available for the system, the company said.

Software includes a multiple transaction system capable of handling up to 40 separate inquiry programs at once and an on-line manufacturing system. The 2904 also features an integrated data base management system, according to the firm.

A typical 2904 with 32K of memory, 180M characters of on-line storage, four CRTs, a 600 line/min printer and a 300 card/min reader costs $300,000 or $6,000/mo to rent, the firm said from 555 Madison Ave., New York, N.Y. 10022.

Interdata Adds Disks

OCEANPORT, N.J. – Interdata, Inc. has announced two large-capacity disk storage units for both its 16-bit and 32-bit computer line.

Both the MSM80, an 80M-byte mass storage subsystem and the MSM300, a 300M-byte subsystem, feature 1.2M byte/sec data transfer rate and IBM 3330-type technology, Interdata said.

The MSM80 stores 67.2M-bytes of data on five platters; the MSM300 stores 256M bytes on 19 platters when formatted for use with standard Interdata operating systems, the firm said.

Both drives have a cylinder-to-cylinder seek time of 6 msec and a 30-msec average access time, the firm said. Extra subsystems can be expanded to include up to four drives, it said.

The basic MSM80 costs $25,000 for interface, disk controller, single disk drive and pack. The MSM300 costs $52,000 in single-unit quantities.

After Trying Manual System, Bureau

Mini Proves Half the Solution for Growing Township

By William Saunders

Special to Computerworld

WEST DEPTFORD, N.J. – When both its population and need for services exploded, this small town turned to a full-time administrator and to DP for a solution.

Careful analysis of paperwork problems and systems needs helped West Deptford develop sound accounting procedures.

The story began in April 1974, when a full-time administrator was hired to systematize purchasing, budget planning and tax collection.

At that time, a review of the township's procedures showed the need for centralized purchasing tied directly to a budget encumbrance system.

It took six months for the township to develop a budget account-coding system for uniform municipal budget preparation as well as a budget manual and the encumbrance system. In January 1975, the municipal budget was prepared for the first time under the structured – but manual – system.

The manual system enabled officials to process bills on a bill list basis and pay vendors bimonthly rather than once a month, as was done previously.

Bureau Gets Payroll

Because it took the town's budget clerk four days a week to do the payroll and because of equipment problems, West Deptford's payroll function was farmed out to a service bureau. The bureau already handled the tax and utility billing/accounting, real property tax records and police reporting on a batch basis.

But using the service bureau presented some problems. Information and reports were not available in time to respond to questions from the government and taxpayers.

A feasibility study showed the money appropriated annually to the bureau could finance an in-house mini and, in addition, give the town the flexibility to add more software as the township's needs increased.

After four months of visits to DP installations and sales representatives, the following selection criteria for the mini were set:

- It had to be an interactive on-line, real-time system with multitasking capabilities and no special preinstallation requirements.
- The system had to use a programming language simple enough to allow existing personnel to do basic programming with a minimum of training.
- The vendor had to supply both hardware and software support, be familiar with municipal government and be capable of designing application programs to meet local and state requirements.

With help from the New Jersey Department of Community Affairs' Administrative Assistance Unit, specifications were developed and approved by the state to allow the town to seek bids on the system.

The selected proposal was offered by Infocomp Corp. for a turnkey system based on a Data General Corp. Nova 2/10 with 64K of memory, 10M bytes of disk, a Centronics Data Computer Corp. 101A printer and two Hazeltine Corp. CRTs.

The Micos operating system gave the town the multiprogramming capabilities it required. Based on a three year lease/purchase plan, the system cost $1,685/mo. with 48% of the rental applied to the $60,000 purchase price.

Hardware was delivered last November and the first application was operational in January.

Versatile Budget System

The budget accounting system is versatile and highly efficient; all purchase commitments can be monitored each day.

With access to the computer via a CRT, the purchasing agent can access each budget line item at his convenience. Further, as soon as funds are appropriated for any given purchase, the budget line item is encumbered.

Department heads are now forced to buy through a purchasing department and comply with the state bidding laws. The future status of any item can be forecast based on the file data.

The system has saved the town considerable auditors' fees since hard-copy audit trails can be printed and reports of transactions can be produced.

The payroll system takes care of a myriad of deductions with only the hours worked entered. Overtime is automatically computed. Upon completion of the payroll, the wages are distributed and applied automatically to the relevant budget line item.

Saunders is administrator of West Deptford Township.

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McDonnell Douglas Corporation

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Philip D. Quarles,
Vice President, Data Processing,
TAFEX Systems Corporation

Mini Used for Inventory Control Works in Three Areas

MODESTO, Calif. – A minicomputer used for inventory control is helping the Modesto Irrigation District here generate reports for accounting, purchasing and warehouse use, according to David B. Glaeser, manager of the DP department.

Although called an irrigation district, the utility has been selling electricity directly to customers within its geographic area since 1923; selling electricity has become its primary business, Glaeser noted.

Modesto has one warehouse where materials are received and issued to work crews and engineering departments. These materials range from wire and bolts to gasoline and herbicides.

The utility has a 32K NCR Century 50 with 18M bytes of disk, a 450 line/min printer, card reader, I/O writer, a key-to-tape system and controller. The system leases for $3,300/mo.

Tight Deadline

In the fall of 1974, Glaeser was given four months to develop a computerized perpetual inventory control system for all items over which the warehouse and purchasing departments had control, he said.

To meet the tight deadline, he decided to modify the transaction-oriented program for utility billing then being used by Modesto.

The present system was designed to provide both daily and monthly reports. The transaction-oriented system uses such items as batched purchase orders, receivers, stock issues, returns to stock and financial adjustments for delivery charges as input.

On a daily basis, the system produces input batch listings, a transaction journal and a cumulative daily transaction report which covers all transactions to date for the month. Weekly reports include follow-up reports for purchase orders and reorder reports.

Each month, reports which reflect both the financial and stock activity for the entire inventory are produced for the accounting department and other system users.

Modesto uses the averaging method of inventory valuation. When the system was begun, the existing inventory was assigned unit prices by dividing book value by the item quantities.

Since the system went into operation, the unit price of an item has been recalculated after every transaction. An input and error listing for financial adjustments enables Modesto to correct the book value of an item for freight and tax charges.

As a further aid to the accounting department, the value of each transaction as well as the numbers of items involved is shown in the transaction journal and report.

The system also generates a listing which features complete item identification which the warehouse uses in taking inventory. Except for a few high-priced items such as wire, Modesto's warehouse stock is inventoried on a cyclical basis with one-twelfth of the entire stock inventoried each month.

The listing generated for this purpose by the system can include any section of the inventory base and is current to the previous day's transactions, Glaeser said.

Among the reports of particular value to the purchasing department are reorder reports for items which are automatically reordered when certain criteria are met and reports for other reorder items which have shown activity during the month.

The minicomputer runs about 16 hour/day with a staff of two operators, three keypunchers, an operations supervisor and the DP manager.

Ball Has Floppy For Micronovas

SUNNYVALE, Calif. – Ball Computer Products, Inc. has a floppy disk subsystem designed to interface with Monolithic Memory, Inc.'s Micronova processor and Data General Corp.'s (DG) Micronova.

Consisting of two floppy disk drives and a single board controller, the stand-alone Model 3190G subsystem connects to the I/O bus and does not have to reside within the computer, Ball said.

In addition, the unit's chassis will pass the I/O bus to other peripherals if desired. The unit occupies 7 inches vertically in a standard 19-in. rack, Ball noted.

The floppy disk drives feature a storage capacity of 3.2M bits (IBM-compatible), ferrite read/write heads and a positioner that uses three-step movement track-to-track.

The transfer rate is 250 kbit/sec, the firm said.

The controller also features read-before-write address verification, diagnostic mode and individual write protect.

The controller board will interface up to eight disk drives and can also accommodate a real-time clock and teletypewriter interface, it added.

The Model 3190G, including two floppy disk drives and controller, is priced at $4,700. Ball is at 860 E. Arques Ave., Sunnyvale, Calif. 94086.

Exide UPS systems are protecting some of the largest computer centers in the country. An Exide Uninterruptible Power Supply system filters out the spikes and transients commonly found in raw utility power. And, depending on your time requirements, an Exide UPS system will continue to feed smooth, constant power during utility blackouts and brownouts.

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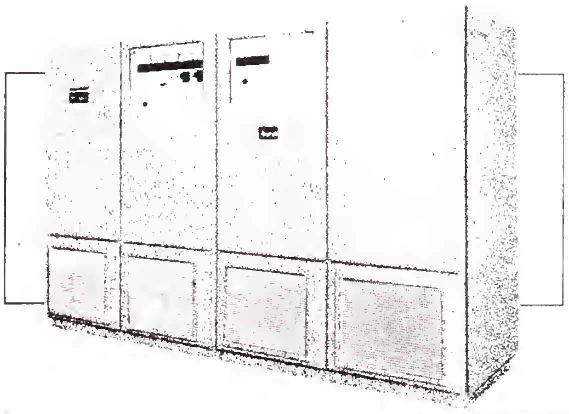
Exide is the only UPS manufacturer that makes all the major components: Rectifier/charger, stationary battery, static inverter and static switch. This means that your UPS will be carefully designed as a complete system. All the components, from the utility power takeoff to the computer interface, have a single source of responsibility—Exide. You can depend on Exide UPS.



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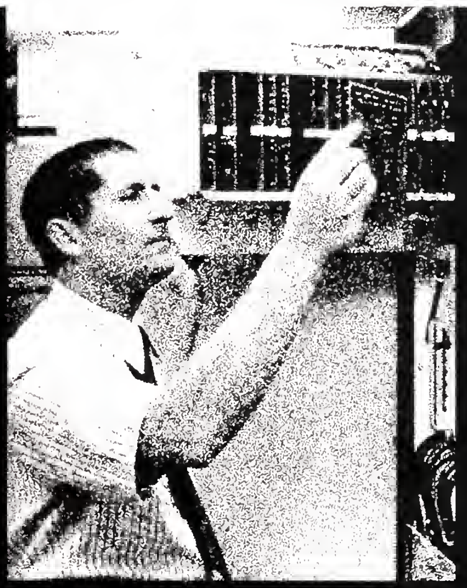


"We chose the Exide system primarily because of the ease of maintenance and repair. Due to its design, a person with basic electronic knowledge can troubleshoot and repair most failures. Also, we were impressed with the Exide representative's knowledge of their product and his knowledge of UPS Technology. Along with this, their equipment pricing was very competitive."

Robert Watters, Maintenance Engineer, Dallas Federal Savings

"When the energy crunch started in late 1973, COMPU-SERV realized that if we were going to continue to provide reliable computing services to our users, we would need to find a reliable, cost-effective 'uninterruptible power source.' After talking with several possible vendors, it became apparent to COMPU-SERV that Exide Power Systems could deliver such a system as a total package in a reasonable time frame. Our 250 KVA UPS has been on-line for over eighteen months now. We are pleased with the increased computing reliability this Exide UPS has allowed us to provide the remote users of our nine large systems."

Len Kaiser, Site Manager, COMPU-SERV

Micro Products

AMI Has Developer, Evaluator

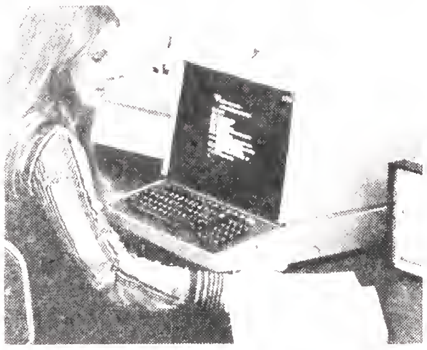
SANTA CLARA, Calif. – American Microsystems, Inc. (AMI) has a Microcomputer Development Center (MDC) and a microprocessor prototyping board for use with Motorola 6800-type microcomputer systems, the firm said.

The AMI 6800 MDS can be used for software development, as a general-purpose data processing system or as an intelligent communications terminal.

The system includes a special-purpose CRT that incorporates AMI 6800 microcircuitry and a dual-drive floppy disk subsystem with more than 500K bytes of on-line storage, AMI said.

For hardware development the system offers remote front panel and read-only memory (ROM) simulator functions and a modular bus-oriented printed circuit card cage supported by general-purpose cards.

Software development programs include the FDOS-II disk operating and file management system and text editor.


AMI 6800 Microcomputer Development Center

The MDC with 16K bytes of memory costs $10,500, the firm noted.

The AMI 6800 Microprocessor Evaluation Board features a built-in programmer for the Eprom microcircuitry. The board can also serve as a general-purpose microcomputer for low-volume systems by the utilization of up to 58 I/O lines and expansion up to 56K bytes of user-available memory, it noted.

AMI 6800 Tiny Basic is included with the system, and a prototyping operating system program resides in the ROM, the firm said.

The board is available in three package options: kit form with the printed circuit board for $295; an expanded kit with 512 bytes of Eprom for $595; and the fully assembled kit with 2K bytes of Eprom and Tiny Basic for $950.

AMI is at 3800 Homestead Road, Santa Clara, Calif. 95051.

Mini Develops System

AMES, Iowa – Computer Applications Corp.'s Minmic 1165, a hardware/software system, allows "the microprocessor user to develop his system on a minicomputer" by using the mini's memory and peripherals, the firm said.

The Minmic 1165 consists of a board that mounts an MOS/Technology, Inc. 6502 microprocessor on the Digital Equipment Corp. PDP-11 bus. Software for the PDP-11 to support the 1165 is also included.

The Minmic 1165 costs $495 and includes the assembled board with the 6502 processor, 1165 software and a manual with full schematics. The firm is at 413 Kellogg, Ames, Iowa 50010.

Software, Speed Pleases Most Users

WALTHAM, Mass. – Eighty-four percent of surveyed microprocessor buyers are satisfied with the speed and software of current products, according to the results of a joint study by International Data Corp. (IDC) and *Computer Design* magazine.

The study, entitled *Survey of Microprocessor Buyers*, indicated three out of every five buyers were incorporating microprocessors/microcomputers into completely new products rather than into improved versions of existing ones.

Process control was the major function being performed by microprocessors/microcomputers, according to the study, and users said increased versatility with cost reduction were the major benefits.

Eighty percent of the study's respondents said microprocessors represented 25% or less of their total equipment cost.

The most important technical criteria for selecting a microprocessor were its instruction set, interface compatibility and speed, the study indicated.

Software development costs represented an average of 42% of total equipment development costs, the study showed. More than 80% of current programming and software was being performed in-house by both programmers and logic designers.

Lower cost and interface standardization were the improvements to microcomputer peripherals mentioned by 40% of the respondents.

Increased reliability and decreased complexity of the peripherals were also desired improvements, IDC said.

The Survey of Microprocessor Buyers costs $395. IDC is at 214 Third Ave., Waltham, Mass. 02154.

Monolithic Adds LSI-11 Memory

ENGLEWOOD, Colo. – Add-in expansion for Digital Equipment Corp.'s LSI-11 16-bit microcomputer is now available from Monolithic Systems Corp. (MSC).

The Monostore XI/Planar semiconductor memory is designed around 4K NMOS dynamic random-access memory (RAM) technology.

The 16K by 16 bit board allows the LSI-11 memory to be expanded within the present chassis, eliminating the need for add-on hardware for memory or peripheral interfacing, the firm said. It also carries "on-board refresh" to eliminate direct memory access problems, it noted.

The DEC LSI-11 is supplied with 4K by 16 bit MOS memory and, in order to fulfill its 28K memory capacity with DEC boards, requires the utilization of all six bus loads the computer can drive, MSC explained.

By employing a Monostore half board (8K) and full board (16K), only two bus loads are used in bringing the LSI-11 to full capacity, freeing other bus loads for interfacing peripherals, the firm said.

The Monostore is software- and hardware-compatible with the LSI-11, the firm said. Because of faster access time and faster cycle time, the Monostore permits existing programs to be used with no modifications.

The price of a 16K by 16 bit Monostore XI/Planar board in quantities of one is $1,195 from Monolithic at 14 Inverness Drive East, Englewood, Colo. 80110.

Dr. Dixon Doll will show you how to plan and manage effective data communications systems.

Data communications has become a focal point for new growth, and new economies, in computer use. But there are many hazards for the user. Even many up-and-running systems have costly flaws that can be improved through better management methods. And that's where these seminars come in.

Computerworld has sponsored Dr. Dixon Doll's two seminars on data communications because step-by-step, they give you the practical information you need to evaluate data communications networks and use them effectively.

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Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and 10 concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Procter & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

Charges and Enrollment

The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

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CI Notes

Honeywell Bull and CII Complete Planned Merger

MINNEAPOLIS – The merger of Compagnie Honeywell Bull with the general-purpose computer business of Compagnie Internationale pour l'Informatique (CII) has been completed, Honeywell said.

The basic terms of the agreement signed in December 1975 with CII and the French government were maintained, according to Honeywell President Edson W. Spencer. The new firm is called Compagnie Internationale pour l'Informatique Honeywell Bull.

The French government will provide subsidies of about $250 million from 1976 through 1980 to offset transition costs.

Honeywell Information Systems will be paid about $58 million for reducing its equity in Honeywell Bull from 66% to 47%. Payment will be reported in Honeywell's third-quarter statements using the equity method of accounting.

Compagnie Machines Bull (CMB), which owned 34% of Honeywell Bull, will hold 53% of the new company. The public shareholders of CMB will own about 65% of the French holdings, with Compagnie Generale d'Electricite and an agency of the French government splitting the remainder.

HP Forms Customer Service Division

CUPERTINO, Calif. – Hewlett-Packard Co.'s (HP) Computer Systems Group has consolidated its customer service activity into a single new division.

The Customer Service Division will be responsible for customer field engineering, repairing and distributing exchange boards and marketing computer supplies for all of the group's six manufacturing divisions.

Supershorts

Hewlett-Packard Co.'s General Systems Division shipped 20 of its 3000-II systems in June.

– – –

Harris Corp. has created Harris Satellite Communications to serve the commercial market for satellite communications equipment.

– – –

Comten, Inc. has restructured its organization with the creation of the Software Products Division in addition to its Communications Systems Division.

$7.5 Billion in 1980: IDC

Small Business Base to Grow 20%/Year

By Toni Wiseman
Of the CW Staff

WALTHAM, Mass. – The installed base of small business systems in the U.S. is expected to grow at an average annual rate of 20% from just over $3 billion in 1975 to over $7.5 billion by the end of 1980, according to *EDP/Industry Report* (EDP/IR).

The portion of that installed based attributable to non-IBM mainframers will approach $2 billion by then, the report stated. IBM will have about $4.5 billion of the installed base, leaving the independents and mini makers with less than $1 billion each.

Major suppliers of small business systems fall into four categories: IBM, other mainframers, independents and minicomputer vendors, EDP/IR said.

At year-end 1975, IBM had over two-thirds of the installed units and 68.3%, or $2.14 billion, of the installed value base.

The IBM 3/10 accounted for 53.5% of the installed dollar value, while other members of the IBM/3 family accounted for 9.1%. The System 32 accounted for 5.7%.

There were 5000 System 32s, 2,750 3/6s, 1,200 3/8s and 16,700 3/10s installed at year-end 1975, according to International Data Corp. (IDC), the market research firm that publishes EDP/IR.

"IBM 3 and 32 users cite the company's service and support as their major reason for acquisition and examine other vendors' offerings to a much lesser extent than other small system users," EDP/IR stated.

Among other mainframe manufacturers, NCR had an installed base of 1,245 machines, both Century 50s and 8200s, at year-end 1975.

Burroughs was close behind with some 1,200 installed machines including the B700 family and B1712/14/18.

Univac rounded out the "other" mainframe group with offerings from the 9200/9300 category of which there were 1,750 installed, according to IDC estimates.

NCR totaled 3.9% of the installed dollar value, Burroughs 3.6% and Univac 8%, which gave non-IBM mainframe manufacturers a total market share of 15.5%.

(Continued on Page 34)

Independents Seem Unconcerned About Lower Priced System 32

By Molly Upton
Of the CW Staff

Several marketing executives at small business machines firms contacted recently were unaware of IBM's announcement of lower priced models of its System 32.

Most did not seem overly worried, indicating their systems either offer more for the same money or much more for a slightly higher price than the 32 A01, the lowest priced member of the 32 family [CW, June 28].

IBM is offering the A01 under the Term Availability Plan for $680/mo or $714/mo on rental. The unit has a 3.2M-byte disk and a 40 char./sec unidirectional printer rather than the 5M-byte disk and 40 char./sec bidirectional printer offered on the 32 that was previously the bottom of the line.

IBM Playing Game?

One industry source observed perhaps IBM is playing the same game some other vendors have been playing sporting a model with an attractive price tag in order to lure customers into looking at the product line, while knowing most will select higher ticket systems because they need more capabilities.

The 32 A01 puts IBM "in the ballpark from a dollar point of view only, not from a feature point of view," according to Donald L. Schnitter, director of marketing services at Basic/Four, Inc.

Basic/Four's minimal unit has interactive capability, a 4M-byte disk and a 165 char./sec printer. It rents for under $1,000/mo and sells for $34,400, he said. The firm recently increased the minimum disk size to 5M bytes rather than 2.1M bytes.

About 99% of its customers were ordering the 4.2M-byte disk, which was available for an additional $2,000. By using 200 track/in. disks, Basic/Four increased the capacity of the 4.2M-byte unit to 5M bytes at no extra cost, Schnitter said.

"A 3.2M-byte disk usually isn't

(Continued on Page 34)

Keydata Courting Small Firms

WELLESLEY, Mass. – Keydata Corp. is courting the small business whose revenues range from $750,000 to $5 million by offering a packaged plan that reduces the minimum monthly cost of time-sharing to $800.

Designed for distribution and manufacturing firms, Keydata's System 800 plan offers billing, inventory control, accounts receivable and sales analysis as well as a variety of reports (see story on Page 17).

By packaging the plan and limiting some of the functions available under its other services, Keydata has reduced its minimum price from between $1,100/mo and $1,200/mo, according to Frank Girard, vice-president of marketing.

The System 800 was designed to give first-time users a choice, he said, noting they won't necessarily have to get a minicomputer.

The firm's customer set is principally made up of firms in the manufacturing and distribution areas whose sales are $2 million or more, he explained.

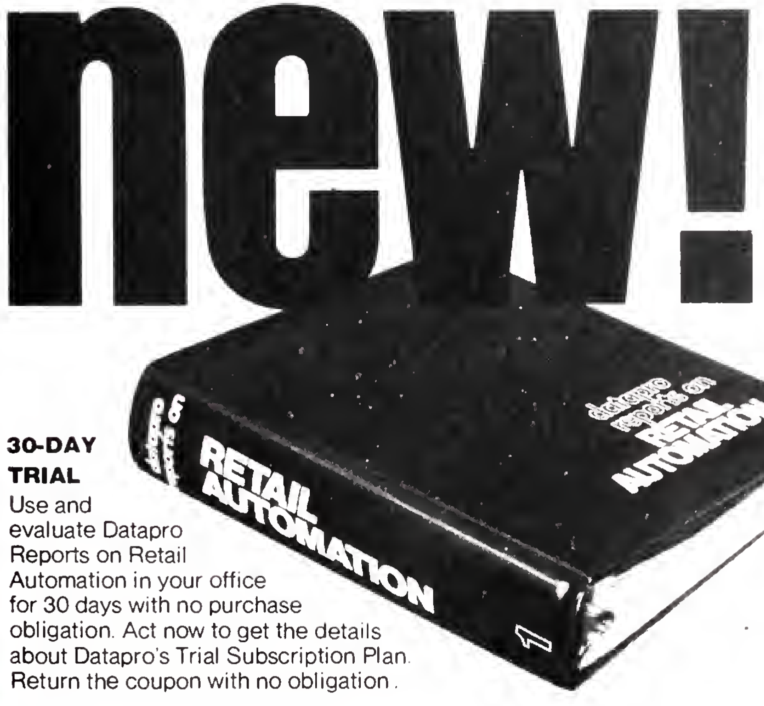
Keydata had not gone after the market with sales below $2 million very aggressively before, "but with the activity the minicomputer manufacturers have generated in that segment of the market, we feel there's a lot of opportunity for us," Girard said. "It really represents a new market for us."

Response to the plan, which the firm has been selling for about three weeks, has been "tremendous, far exceeding anything we expected," he said, adding Keydata has already booked customers.

Smaller businesses with little or no computer experience "are being inundated by sales presentations from people trying to convince them to install in-house minicomputer systems," L. Edwin Donegan Jr., Keydata president, said.

"The small businessmen who run these companies generally lack the experience to undertake the risks involved in hardware selection, software creation and the day-to-day operation of even the smallest minicomputer system," he said.

But, he noted, "these risks are more significant to them than to larger companies, since computer failures can literally put a small company out of business."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Independents Show Little Worry Over Lower Cost 32

(Continued from Page 33)

enough," he remarked.

Wang Laboratories, Inc. offers a system with 10M bytes of disk and a 200 char./sec printer for slightly over $30,000, according to Ned Chang, marketing vice-president.

Concern Over Long Term

Chang is not overly concerned about IBM in the short term, "but you always worry about the long-term effects of what it does," he said.

"In the short term [IBM hasn't] been a problem for us yet," he added.

In pondering IBM's recent version of the 32 for word processing, Chang said it looked like IBM was trying to get more marginal business on the 32.

"The systems are not the same as ours at all," he commented adding Wang's philosophy has been that most people using word processing will use it on a dedicated basis.

"It's not normally productive to tie up a computer console," he commented, but "it's possible IBM may find a bunch" of such users.

"It's really more cost-effective for us to look for customers of $12,000 to $18,000 dedicated word-processing systems. There are many more of those people," he said.

Chang said he sees IBM as being more or less "locked in" to its rental base of 150,000 to 180,000 word-processing systems so it can't radically change technology at the same price very fast.

IBM has "to go at it relatively slowly. It looks to me like with the 32 it's starting at the top end of that and working its way down slowly."

Noel Kile, vice-president of marketing for Qantel Corp., said the lowest model of the 32 adds a lot more credibility to the market, just as the original 32 announcement did.

Qantel offers more for less money than IBM, Kile said. A Qantel system with a 6M-byte disk and 45 char./sec bidirectional printer sells for $22,500. A communications option is available on the system.

G.P. Williamson, an NCR marketing vice-president, said the lower model of the 32 broadens IBM's spectrum of competition. "I think you have to look at that on an industry-by-industry basis to assess what the impact is going to be," he added.

A possible motivation for IBM's introduction of the product, he suggested, is to "get down to an account that is more what it originally intended for the 32."

This would give the users some room to grow on the system, Williamson said. In some cases it is possible that full implementation of the Industry Application Programs on a 32, as might be the case with larger users, could mean the system was running at or very near capacity shortly after installation, he noted.

"The size account the 32 could be implemented in was probably smaller than IBM originally projected," he observed.

Williamson said he doesn't see much effect on either the NCR 8200 or the 499.

The 8200, with its interactive applications, offers head-to-head competition, although generally its price tag is slightly more than the 32.

"But it's a totally different concept of DP," he added, since the 8200 is an interactive, on-line data base-oriented system. The 32 is batch-oriented with inquiry and data capture capabilities, he said.

"Our indication is that the market likes interactive capabilities," he said. "I think the entry-level user would rather have a more complete, easy-to-use system than a batch-oriented system that involves many changes of floppies."

Minimum rental of an 8200 is $1,200/mo and purchase prices are in the $40,000 to $50,000 range. The 8200 handles up to seven terminals, with 5M- to 40M bytes of disk and an operating system that handles up to seven jobs simultaneously, he said.

NCR's 499, at the low range of the 32, is oriented to the user who wants a visible record and sells for $15,000 to $25,000. Williamson said he doesn't see the 32 having a tremendous effect on this market.

Small Business Mart To Grow 20%/Year

(Continued from Page 33)

"In cases where users considered more than one supplier when they acquired their [small business] system, one of the competing vendors was a non-IBM mainframer 55% of the time," according to EDP/IR.

Main Competitors

Singer and Basic/Four are the main competitors in the independent area.

With 1,950 System Tens installed, Singer boasted 6.8% of the installed market value, while 1,000 installed 350s, 400s and 500s give Basic/Four 3.6% at year-end 1975.

Wang's WCS 20 and WCS 30 and Qantel's 800, 900/1100 and 1200 machines accounted for a total of 1.1% of the market value.

Lockheed and Microdata were among the minicomputer vendors who had found ways – primarily through systems houses and distributorships – to wrap their systems in enough software and applications packages to turn them into small business systems, EDP/IR stated.

Lockheed had .5% and Microdata .3% of the market value. Digital Equipment Corp., with its 300 and 500, held 2.4% of the installed value.

Among the most likely buyers of small business systems – companies with sales less than $25 million – almost twice as many companies did not use an in-house computer as those who did, IDC found.

Of the noncomputer users, about 40% used an outside service bureau, 30% used only manual methods and 20% used accounting machines.

Of the computer users, over 60% used just a computer while 25% used a computer and a service bureau.

Nearly 20% of small business computer installations supplanted sevice bureau usage, while 75% replaced either manual methods or accounting machine methods.

In only about 5% of the instances did small business computers replace another computer, the report showed.

Core Memories Face Phaseout

Dataproducts Concentrating on Printers

By Esther Surden
Of the CW Staff

WOODLAND HILLS, Calif. – Dataproducts Corp., which once was a multiple peripheral company, has almost entirely phased out its extraneous business and is concentrating on the printer marketplace, according to Irving L. Wieselman, vice-president of product programs.

The only other significant factor in the firm's product line is core memories which, Wieselman said, can still be cost-effective in the larger sizes. These will also be phased out, he indicated.

The firm is embarking on production of matrix printers as well as its traditional line printers, he said.

Dataproducts sells the printers as an OEM to such firms as Digital Equipment Corp., Hewlett-Packard, Basic Four and Olivetti, with no one of its customers having more than 15% of the business, Wieselman said.

Similar Markets

The markets the matrix printers would serve would be similar to the firm's traditional markets, Wieselman said, because mini users need both the line printer and the less expensive, slower matrix type, depending on customer applications.

These would include the small business market, terminals and the lower end of the mini lines, he said.

Dataproducts has seen a trend towards lower cost and higher reliability in line printers dictated in part by the OEM customers.

"As more systems went out, it became more costly for the OEM to do maintenance," Wieselman explained. The firm has responded by developing technology that uses as few mechancial parts as possible and minimizes points of wear.

Family Concept

The firm has also been working toward a family concept in printers, he said, to minimize spares requirements. "Although we pioneered it, General Electric and Control Data Corp. have adopted this concept. Users have dictated this approach," he said.

Dataproducts' Mark IV Hammerbank is mounted on a flexible pivot and is servo-driven via coil positioner, Wieselman said. An optical transducer is used for positioning and a magnetic transducer is used for velocity sensing.

In Dataproducts' Charaband printer, a metallic-type module with two characters in the type face is inserted into the cylindrical receptacle of a type slug. The slug, attached to the band, becomes the carrier of the type.

The band is driven by a pulley which, in turn, is motor-driven, and the Charaband font carrier rides on ball bearings; magnets also constrain the band. This reduces the need for lubrication, Wieselman said, noting most train printers need complex lubrication.

The firm has also used a microprogrammed processor architecture in its line printers to help control the printing, he added.

Firm OEMing Parts

WOODLAND HILLS, Calif. – Dataproducts Corp. has entered into the OEM component area by marketing components of its line printers.

The firm has begun selling its Mark IV Hammerbank and Charaband horizontal font carrier for OEM purchase on a worldwide basis.

Dataproducts is offering the Hammerbank in either complete assemblies or customized modules for column, label or tag printing as well as for other specific applications.

Detachment, Concern In Range of Reaction To IBM 3/15D News

Reactions from makers of machines that compete with the IBM 3 ranged from relative indifference to an acknowledgement the recently introduced Model 15D [CW, June 28] will make IBM more competitive against independents.

Bill Krause, marketing manager for Hewlett-Packard Co.'s (HP) General Systems Division, said the 3/15D will make it more difficult for HP's 3000 line to compete against IBM, although the 3000s have a considerable price advantage.

When users previously outgrew their 3s, they had to leave the IBM fold unless they wanted to go to a 370, he said. Now IBM offers a machine with a higher performance capability to those users who want to stay with IBM.

Expected a Bridge

Krause was a bit surprised at the announcement's "lack of punch," he said, because he was expecting IBM to announced a bridge system between the 3 and the 370 or a replacement for the 3.

"It's an awkward attempt to make a bridge computer," he said.

Krause views the 15D as an attempt to halt the erosion of the 3 base as HP and others have been luring away users who had outgrown it.

Donald W. Fuller, president of Microdata Corp., said the 15D still doesn't have the kind of software features needed to serve the market looking for data base applications.

In comparable configurations, the Microdata Reality costs less than the 15D and its software is more powerful, he said.

"So far I haven't seen anything in software that really makes a giant step forward where [users] can really use the machine in inventory control applications," he said.

"But you can't ignore the trend," he added.

IBM is offering more and more low-end machines as it nibbles away at that marketplace, he said, but he thinks it will be quite some time before IBM offers virtual capability on the System/3.

William R. Doniger, executive vice-president of Mini-Computer Systems, Inc., said the 3/15D "doesn't bother us. It's a big world and we're getting our share. There's plenty of demand."

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Forward detailed resume with salary requirements and published writing samples to William Mersch, Digital Equipment Corporation, Dept. K712, 162 Main Street, Maynard, Mass. 01754.

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Qualified applicants should forward resume, including salary history to: Mr. J.N. Hogenmiller, Corporate Employment Department

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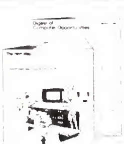
1976 Computer Salary Survey.



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Marathon Oil Company has opportunities for experienced System Software Analysts who have a minimum of two years experience on large scale IBM 370 Systems.

Responsibilities include maintenance of current operating system (SVS), evaluation of new software, trouble shooting and resource management.

We are seeking candidates

- Who have a college degree preferably in Math or Computer Science
- Who have two years experience in OS MVT or VS2R1.7 (SVS) or VS2R2.+ (MVS) or any combination thereof
- Who are seeking high visibility in a performance-oriented environment

These positions are located in Marathon's General Office in Findlay, Ohio, and offer a salary commensurate with education and experience and a complete benefits package.

Interested? Pick up the phone NOW and call this number collect 419-424-0030. It will take just a few minutes of your time (we will accept calls from 8 a.m. to 4 p.m. eastern daylight time weekdays and from 1 p.m. to 4 p.m. eastern daylight time on Saturdays and Sundays.) Principals only, no agencies!

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Our expanding data processing department, utilizing IBM 370 hardware and virtual OS, is currently developing a corporate IMS data base. This progressive application has created the need for 2 Programmers to support our project team environment. These are positions of high visibility involving short lines of communication and a national communications network. Primary responsibilities include analyzing specifications, estimating programming time requirements and testing, implementing projects and complete documentation. The opportunity also exists for full analyst and programmer responsibility on selected projects.

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A minimum of 4 years COBOL programming with at least 1 under full OS, and a thorough working knowetdge of JCL and OS. A bachelor's degree and additional computer languages are preferred. The salary is upper teens.

PROGRAMMER

Must be seasoned by the above background with a minimum of 2 years COBOL. This salary is in the mid-teens.

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The Center for Information Processing has a position available on the administrative programming staff for a person with Bachelor's degree and minimum of two years programming/analyst experience. Thorough knowledge of COBOL required. Monthly salary range: $1,307-$1,573. Another vacancy is also available on the instructional support staff for a one year appointment. Requirements include a Bachelor's degree plus two years relevant experience, plus a working knowledge of FORTRAN and BASIC. Monthly salary range: $1,307-$1,573. Computer Operator position also available, requiring two years college plus one year experience, or appropriate education/experience combination. Monthly salary range: $871-$1,044. Preference will be given to applicants who have demonstrated their effectiveness in a higher education setting. The Center serves the instructional, research, and administrative computing needs of California State University, Fresno, with an enrollment of 15,500 students. Principle hardware includes a CDC 3150 and a DEC PDP 11/45, plus telecommunications to a CDC Cyber 173. Apply by July 26, 1976. Submit application/resume to: **James E. Forden, Staff Personnel Officer, California State University, Fresno, Fresno, Calif. 93740, (209) 487-2360.**

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An opportunity also exists for participation in the architectural design of an Automated Health Care System.

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These positions involve assignments in systems development. Responsibilities include the conception of new systems and the design, analysis and simulation of these systems. Activities will center about microprocessor-minicomputer systems; developing effective financial business systems; developing and simulating data communications schemes; the development and implementation of software and hardware architecture to satisfy the system requirements.

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- **System Analysts**
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Submit your résumé to, or call, Wally Webster, (509) 942-7784, Boeing Computer Services Richland, Inc., Room 149-B5, P.O. Box 300-A4, Richland, WA 99352.

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SOFTWARE PROFESSIONALS

Harris Composition Systems Division in Melbourne, Florida, is adding to its professional engineering staff. Harris is the recognized leader in the design and development of electronic newsrooms, photocomposition systems and electronic typesetting for the newspaper and commercial printing markets.

We are seeking assembly language programmers to support the development of CRT terminal operating software and real time program modules in a minicomputer environment. Successful engineers will become members of a small group involved with the definition and implementation of large data base disc operating systems. Experience with PDP 11 equipment is very desirable.

Positions require B.S. or advanced degree plus 2-5 years related experience.

Harris Composition Systems is located in the heart of Florida's fabulous recreation area with miles of beaches, excellent fishing and the finest in sailing and boating waters. Harris offers attractive salaries, complete company benefits and a generous relocation policy. To arrange for your interview, send your resume and salary history, in confidence, to: W.T. Schaefer.

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The Tennessee Valley Authority is seeking several highly qualified analyst/programers with experience in Data Base Management Systems (DBMS), On-Line Processing Applications, and experience in on-line program development.

TVA's computing facility consists of an IBM 370/165 with 4 megabytes of main storage supporting 85 time sharing terminals and 14 remote processors under OS/MVT, HASP, TSO, and System 2000, and substantial expansion is in progress.

Work involves any and all aspects of professional systems analysis and associated programing. Duties will include providing systems analysis and programing under a project oriented approach to computer users throughout TVA. Additional duties will include tutoring and periodic teaching of formal classes in TSO, DBMS, and programing languages.

Applicants should have a Bachelor's degree in mathematics, statistics, computer science, or one of the scientific disciplines, plus a minimum of three to five years experience in programing business applications on an IBM system comparable to the one described above. Competence in programming COBOL is essential and programing experience in PL/1 or FORTRAN would be helpful.

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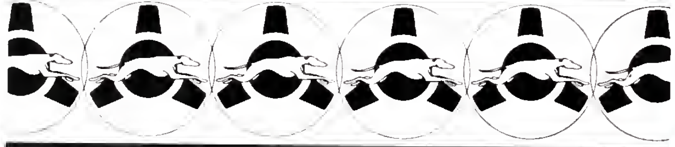

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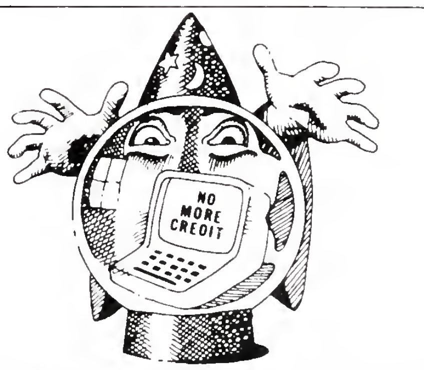

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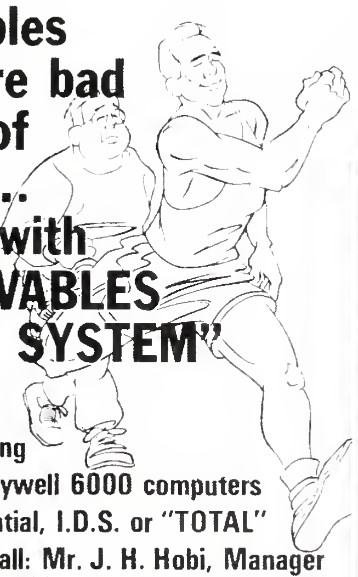

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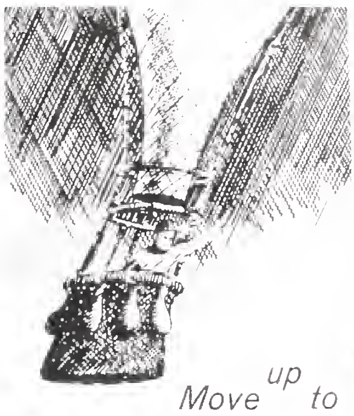

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DCC Gains

FAIRFIELD, N.J. – Digital Computer Controls, Inc.'s (DCC) earnings for the first quarter ended May 31 were $495,725 or 32 cents a share compared with earnings of $89,462 or 6 cents a share in the year-ago period.

Sales reached $4.8 million compared wtih $2.3 million.

For the year ended Feb. 29, DCC earned $625,262 or 40 cents a share, up from $230,697 or 15 cents a share.

Dataproducts 1976 Net Sets Record

WOODLAND HILLS, Calif. – Dataproducts Corp.'s fourth-quarter and 1976 earnings set records for the company.

Fourth-quarter earnings climbed 44% to $2.2 million or 30 cents a share compared with $1.5 million or 22 cents a share in the year-ago period, which included a $199,000 charge from expenses of Data Card Corp.

The 1975 periods were restated to treat Data Card as an unconsolidated subsidiary, the firm said.

Revenues in the quarter climbed to $23.4 million compared with $20.7 million in the same period last year.

For the year, Dataproducts earned $7.1 million or 98 cents a share compared with $5.8 million or 85 cents a share last year.

There was a $1.1 million credit during 1976 from the sale of Data Card stock while 1975 included a charge of $778,000 from Data Card. In June 1975, Dataproducts reduced its holdings in Data Card from 66% to 26%.

Revenues for the year declined slightly to $85.1 million compared with $85.9 million last year.

"All elements of the business contributed to profitability in each quarter of the year," according to President Graham Tyson.

Backlog at year end was $48.6 million compared with $37.3 million a year earlier.

"The major markets we serve appear to have recovered from the recession," he said.

Earnings Quintuple in Nine Months, Grow Threefold in Quarter at SDC

SANTA MONICA, Calif. – System Development Corp. (SDC) saw its earnings grow five-fold in the nine months and more than triple in the third quarter.

During the nine months the firm earned $1.4 million or 75 cents a share compared with $243,000 or 13 cents a share in the year-ago period.

Revenues declined slightly to $79.3 million in the nine months ended March 28 compared with $79.5 million in the same period last year.

For the quarter, earnings totaled $498,000 or 27 cents a share compared with $144,000 or 8 cents a share in the same 1975 period.

Revenues declined to $27.7 million compared with $27.8 million in the year-ago quarter.

The rise in third-quarter earnings resulted primarily from improved profitability of domestic operations aided by reduced losses from foreign operations and reduced interest charges, according to George E. Mueller, SDC chairman.

During the quarter, SDC acquired Moll Associates, Inc., which will operate as its financial data services division.

Fabri-Tek Reduces Loss for Year

MINNEAPOLIS – Fabri-Tek, Inc.'s 1976 revenues declined, but so did its loss for the year ended April 2.

The memory maker's revenues dropped to $28.9 million compared with $35.3 million in 1975.

Losses totaled $1.5 million or 42 cents a share, down from $1.7 million or 46 cents a share last year.

"The reduced revenues were experienced largely in the core memory areas of our business, which is tied very closely to the capital equipment segment of the economy," L.D. Altman, Fabri-Tek president, explained.

The firm's National Connector Division and Digiac, an educational systems subsidiary, both improved in revenues.

"Although the year was very disappointing, order volume for the first quarter of the current fiscal year was up significantly and we anticipate that shipments will rise steadily throughout the year," he said.

Wang Net Shows Jump In Nine-Month Period

TEWKSBURY, Mass. – Aided by a sizable jump in third-quarter earnings, Wang Laboratories, Inc.'s nine-month earnings rose to $3.3 million or 64 cents a share from $1.8 million or 35 cents a share in the same period last year.

Revenues for the nine months reached $65.2 million compared with $51.3 million in the year-ago period.

For the third quarter, earnings climbed to $1.1 million or 21 cents a share compared with $170,000 or 3 cents a share in the same period last year.

The earnings jump occurred while revenues rose to $22.9 million compared with $17.4 million in the year-ago period.

Total backlog on March 31 was $14.2 million compared with $11.2 million a year ago.

New Registrations

AMDAHL CORP., 1250 E. Arques Ave., Sunnyvale, Calif. 94086, a computer manufacturer, filed to register 1 million shares of common, of which 928,000 are being sold by the company. The First Boston Corp., 20 Exchange Place, New York, N.Y. 10005 is the underwriter.

...Toward the Bottom Line

$$$

Inter-Continental Computing reported a loss of $189,308 in the first quarter resulting primarily from a decline in revenues from its casualty insurance software subsidiary.

$$$

Advanced Computer Techniques declared a dividend of 5 cents a share on fiscal 1976 results payable Aug. 20 to shareholders of record July 2.

$$$

Prudential Insurance Co. of America has approved a $1 million loan to **T-Bar** in the form of a 15-year note at 11.25%. Proceeds will be used to refund existing bank loans and for additional working capital.

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Storage Technology declared a 6% stock dividend payable July 2 to stockholders of record June 4.

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Mathematica declared a regular semiannual cash dividend of 10 cents a share payable June 25 to shareholders of record June 1.

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Conrac will pay its first stock dividend, 10%, on July 30 and increase the regular quarterly cash dividend to 20 cents a share payable Sept. 15 to holders of record Aug. 30. The previous dividend was 17.5 cents a share.

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IBM has named Salomon Brothers of New York City as independent brokers in purchasing IBM stock for the IBM Employees Stock Purchase Plan that began July 1.

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For additional information, please contact Mr. Phil Shapiro – President, by July 23, 1976 at:

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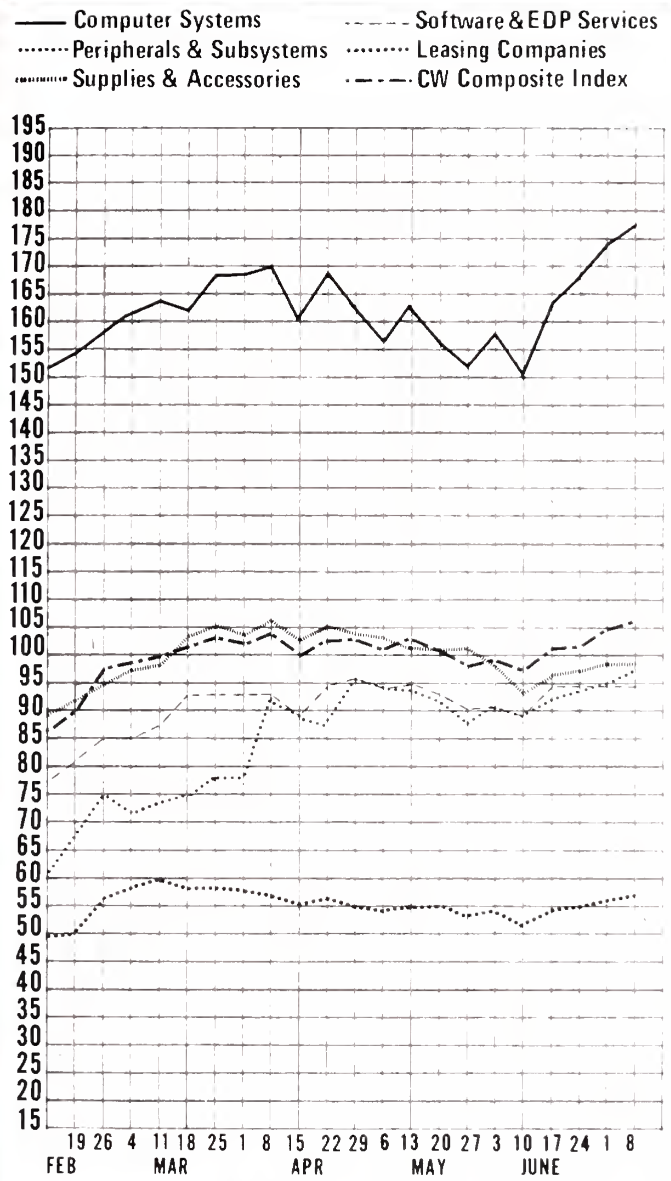

Earnings Reports

MICRODOT
Three Months Ended March 28

	1976	1975
Shr Ernd	$.76	$.69
Revenue	81,971,000	80,547,000
Earnings	3,089,000	3,027,000

MODULAR COMPUTER SYSTEMS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.10	$.19
Revenue	9,811,000	8,672,000
Earnings	280,000	548,000

PRIME COMPUTER
Three Months Ended April 4

	1976	1975
Shr Ernd	$.16	$.03
Revenue	3,957,000	2,226,000
Tax Cred	177,000	27,000
Earnings	365,000	52,000

NATIONAL COMPUTER SYSTEMS
Year Ended Jan. 31

	1976	1975
Shr Ernd	$1.02	$.73
Revenue	9,108,100	8,018,000
Earnings	606,800	433,200

PROGRAMS & ANALYSIS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.04	$.01
Revenue	909,465	711,956
Earnings	35,576	5,048

SCIENTIFIC SOFTWARE
Three Months Ended March 31

	1976	1975
Shr Ernd	$.13	$.12
Revenue	1,644,527	1,009,017
Tax Cred	68,672	72,905
Earnings	162,395	153,130

STANDARD COMPUTER
Three Months Ended March 31

	1976	1975
Shr Ernd	$.37	$.04
Revenue	1,614,000	1,541,000
Earnings	220,000	22,000

MATHEMATICA
Three Months Ended March 31

	1976	1975
Shr Ernd	$.21	$.10
Revenue	5,161,700	3,697,100
Earnings	147,300	72,700
9 Mo Shr	.64	.59
Revenue	13,049,300	10,755,600
Earnings	447,000	414,000

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COMPUTER SYSTEMS

EXCH		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	101 5/8	-2 3/8	-2.2
O	COMPUTER AUTOMATION	10- 19	18 1/8	- 3/4	-3.9
N	CONTROL DATA CORP	18- 27	24 1/4	+ 5/8	+2.6
N	DATA GENERAL CORP	40- 60	53 7/8	- 3/4	-1.3
O	DATAPOINT CORP	24- 46	44 3/4	+ 1/2	+1.1
O	DIGITAL COMP CONTROL	2- 7	7 1/8	+ 3/4	+11.7
N	DIGITAL EQUIPMENT	128-181	178	+1 1/4	+0.7
N	ELECTRONIC ASSOC.	2- 5	2 3/4	- 1/8	-4.3
A	ELECTRONIC ENGINEER.	7- 15	12 1/8	- 1/8	-1.0
N	ECHCORP	28- 46	42 1/2	-1 1/2	-3.4
O	GENERAL AUTOMATION	5- 11	7 1/4	- 1/4	-3.3
O	GRI COMPUTER CORP	1- 1	5/8	+ 1/8	+25.0
N	HEWLETT-PACKARD CO	95-117	116 5/8	+1 7/8	+1.6
N	HONEYWELL INC	34- 56	50 3/4	+1 1/8	+2.2
N	IBM	227-278	278	+1 1/4	+0.4
O	MANAGEMENT ASSIST	1- 3	2	+ 1/8	+6.6
O	MEMOREX	18- 33	31 3/4	+2	+6.7
O	MICRODATA CORP	10- 26	26	+1 3/4	+7.2
O	MODULAR COMPUTER SYS	9- 14	12 1/2	- 1/4	-1.9
N	NCR	24- 35	34 5/8	0	0.0
O	PRIME COMPUTER INC	4- 12	12	+2	+20.0
N	PERKIN-ELMER	19- 27	23 7/8	+ 3/8	+1.5
N	RAYTHEON CO	45- 62	62	+2 1/4	+3.7
N	SPERRY RAND	40- 51	50 3/4	- 1/2	-0.9
O	SYCOR INC	20- 31	26 1/4	-1 1/4	-4.5
A	SYSTEMS ENG. LABS	6- 10	8 7/8	-1	-10.1
N	VARIAN ASSOCIATES	13- 17	15 1/2	- 1/8	-0.7
A	WANG LABS.	11- 20	16 1/8	+ 3/8	+2.3

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	6	- 1/4	-4.0
A	COMMERCE GROUP CORP	2- 3	2 3/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 3	1 3/4	0	0.0
M	DATRONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/8	+	+10.0
N	DPF INC	5- 8	7 5/8	+ 3/8	+5.1
A	GREYHOUND COMPUTER	3- 8	7 1/2	0	0.0
N	ITEL	6- 14	13 7/8	+ 1/8	+0.9
N	LEASCO CORP	6- 14	14	+ 1/4	+1.8
O	LEASFAC CORP	0- 1	1/4	0	0.0
O	NRC INC	0- 1	3/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 3/8	- 1/8	-1.6
N	U.S. LEASING	7- 12	10 7/8	+ 7/8	+8.7

EXCH: N=NEW YORK, A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST: O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 3/8	- 1/8	-8.3
O	ANACOMP INC	9- 11	9	+ 1/8	+1.4
A	APPLIED DATA RES.	2- 4	3 3/8	+ 1/8	+3.8
N	AUTOMATIC DATA PROC	17- 35	33 7/8	- 1/4	-0.7
O	COLEMAN AMERICAN COS	3- 6	3 1/8	0	0.0
O	COMPUTER DIMENSIONS	3- 7	4 1/2	- 1/4	-5.2
O	COMP ELECTION SYSTMS	5- 9	7 1/4	0	0.0
O	COMPUTER HORIZONS	1- 2	2 1/4	+ 1/4	+12.5
O	COMPUTER NETWORK	2- 6	3 1/2	- 3/8	-9.6
N	COMPUTER SCIENCES	4- 8	7 1/8	+ 1/8	+1.7
O	COMPUTER TASK GROUP	1- 1	1 3/8	+ 1/8	+10.0
O	COMPUTER USAGE	3- 6	3 1/2	0	0.0
O	COMSHARE	2- 9	7	- 1/4	-3.4
O	DATA DIMENSIONS INC	2- 4	3 3/8	- 1/8	-3.5
O	DATATAB	1- 1	1	0	0.0
N	ELECTRONIC DATA SYS.	12- 16	13	+ 5/8	+5.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 3/4	+ 1/8	+7.6
O	IPS COMPUTER MARKET.	1- 2	1 1/8	+ 1/8	+12.5
O	KEANE ASSOCIATES	2- 4	3	0	0.0
O	KEYDATA CORP	3- 5	2 3/4	+ 1/8	+4.7
O	LOGICON	4- 4	3 5/8	- 1/8	-3.3
A	MANAGEMENT DATA	1- 3	2 1/8	0	0.0
A	NATIONAL CSS INC	13- 25	23 1/2	+1 1/4	+5.6
A	ON LINE SYSTEMS INC	18- 22	19 7/8	+1 7/8	+10.4
N	PLANNING RESEARCH	3- 5	4 1/4	+ 1/2	+13.3
O	PROGRAMMING & SYS	1- 1	3/8	- 1/8	-25.0
O	RAPIDATA INC	3- 5	2 3/4	0	0.0
O	REYNOLDS & REYNOLDS	13- 21	16 1/4	+ 1/2	+3.1
O	SCIENTIFIC COMPUTERS	1- 1	1/2	- 1/4	-33.3
O	TYMSHARE INC	19- 28	25 3/8	+ 1/4	+0.9
A	URS SYSTEMS	3- 5	4	+ 1/4	+6.6
N	WYLY CORP	2- 7	2 3/4	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	9 3/4	- 1/4	-2.5
O	ADVANCED MEMORY SYS	4- 10	7 3/8	- 3/8	-4.8
N	AMPEX CORP	5- 9	8 1/2	- 1/8	-1.4
O	ANDERSON JACOBSEN	2- 4	3 1/8	+ 1/4	+8.6
O	APPLIED DIG DATA SYS	13- 25	25 1/4	+ 3/4	+3.0
O	BEEHIVE MEDICAL ELEC	3- 9	7 3/4	0	0.0
A	BOLT,BERANEK & NEW	7- 11	10	- 1/2	-4.7
N	BUNKER-RAMO	5- 9	9 3/8	+ 3/8	+4.1
A	CALCOMP	4- 7	5 3/4	- 1/8	-2.1
O	CAMBRIDGE MEMORIES	2- 6	2 3/8	+ 1/8	+5.5
N	CENTRONICS DATA COMP	20- 36	32 3/4	+1 1/4	+3.9
O	CODEX CORP	22- 42	29 1/2	-2 1/2	-7.8
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	3 3/4	+ 1/8	+3.4
O	COMPUTER CONSOLES	4- 7	5 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 5/8	- 1/8	-7.1
O	COMPUTER TRANSCEIVER	1- 3	1 1/8	+ 1/8	+12.5
O	COMTEN	4- 5	8	+ 1/4	+3.2
N	CONRAC CORP	20- 25	21 5/8	- 1/4	-1.1

EXCH		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 4	3 1/2	0	0.0
O	DATA 100	7- 13	9 1/2	+ 3/8	+4.1
A	DATA PRODUCTS CORP	5- 13	12 7/8	+1 1/8	+9.5
O	DATA TECHNOLOGY	1- 2	1 1/2	0	0.0
O	DATUM INC	1- 2	2 1/4	0	0.0
O	DECISION DATA COMPUT	1- 4	2	0	0.0
O	DELTA DATA SYSTEMS	1- 1	3/4	+ 1/8	+20.0
N	ELECTRONIC M & M	1- 3	2 1/2	0	0.0
O	FABRI-TEK	1- 1	3/4	+ 1/8	+20.0
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 3/4	0	0.0
N	HARRIS CORP	34- 49	48 1/2	- 3/4	-1.5
A	INCOTERM CORP	9- 20	12 1/4	+ 1/8	+1.0
O	INFOREX INC	3- 7	3 7/8	- 1/4	-6.0
O	INFORMATION INTL INC	10- 19	13 1/2	- 7/8	-6.0
O	INTEL CORP	60-109	69	+1 1/2	+2.2
A	LUNDY ELECTRONICS	4- 7	4 1/2	- 1/8	-2.7
O	MSI DATA CORP	3- 7	6 3/4	+ 1/2	+8.0
A	MILGO ELECTRONICS	15- 21	19 1/4	- 5/8	-3.1
N	MOHAWK DATA SCI	3- 9	8 3/4	+1	+12.9
O	PENRIL CORP	1- 3	2	0	0.0
A	PERTEC CORP	3- 8	5 3/4	- 3/8	-6.1
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 12	8	0	0.0
O	QUANTOR CORP	4- 5	5 1/8	+ 1/2	+10.8
O	RECOGNITION EQUIP	6- 11	9 1/4	- 1/8	-1.3
N	SANDERS ASSOCIATES	6- 11	9 3/8	- 1/2	-5.1
O	SCAN DATA	2- 4	2 1/8	0	0.0
O	STORAGE TECHNOLOGY	9- 13	10 7/8	- 3/4	-6.5
O	T BAR INC	5- 10	5 5/8	+ 1/8	+2.3
O	TALLY CORP.	4- 6	4	0	0.0
O	TEC INC	3- 5	3 1/2	[illegible]	[illegible]
N	TEKTRONIX INC	45- 64	62 1/4	-1 3/4	-2.7
N	TELEX	3- 5	3 3/4	- 1/8	[illegible]
O	WANGCO INC	11- 22	21 1/8	+ 3/8	+1.8
O	WILTEK INC	2- 2	3 1/8	+ 5/8	+25.0

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE JULY 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/8	+ 1/4	[illegible]
O	BALTIMORE BUS FORMS	4- 5	[illegible] 1/2	0	0.0
A	BARRY WRIGHT	6- 10	7 7/8	- 1/8	-1.5
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	32- 42	33 3/4	+ 1/4	+0.7
O	DUPLEX PRODUCTS INC	15- 24	14 3/4	0	0.0
N	ENNIS BUS. FORMS	6- 9	6 3/4	+ 1/8	+1.9
O	GRAHAM MAGNETICS	8- 12	9 1/2	+ 1/2	[illegible]
O	GRAPHIC CONTROLS	12- 19	14 3/4	- 1/4	-1.6
N	3M COMPANY	53- 65	57 7/8	+2 1/4	[illegible]
O	MOORE CORP LTD	40- 51	40 1/2	+ 1/4	+0.6
N	NASHUA CORP	11- 17	15 5/8	- 1/4	[illegible]
O	STANDARD REGISTER	15- 19	15 1/2	0	0.0
O	TAB PRODUCTS CO	5- 10	9 1/2	- 1/4	[illegible]
N	UARCO	21- 25	21	- 1/8	-0.5
A	WABASH MAGNETICS	4- 9	7 3/4	- 3/8	-4.8
N	WALLACE BUS FORMS	19- 25	19 5/8	+ 1/8	+0.6

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L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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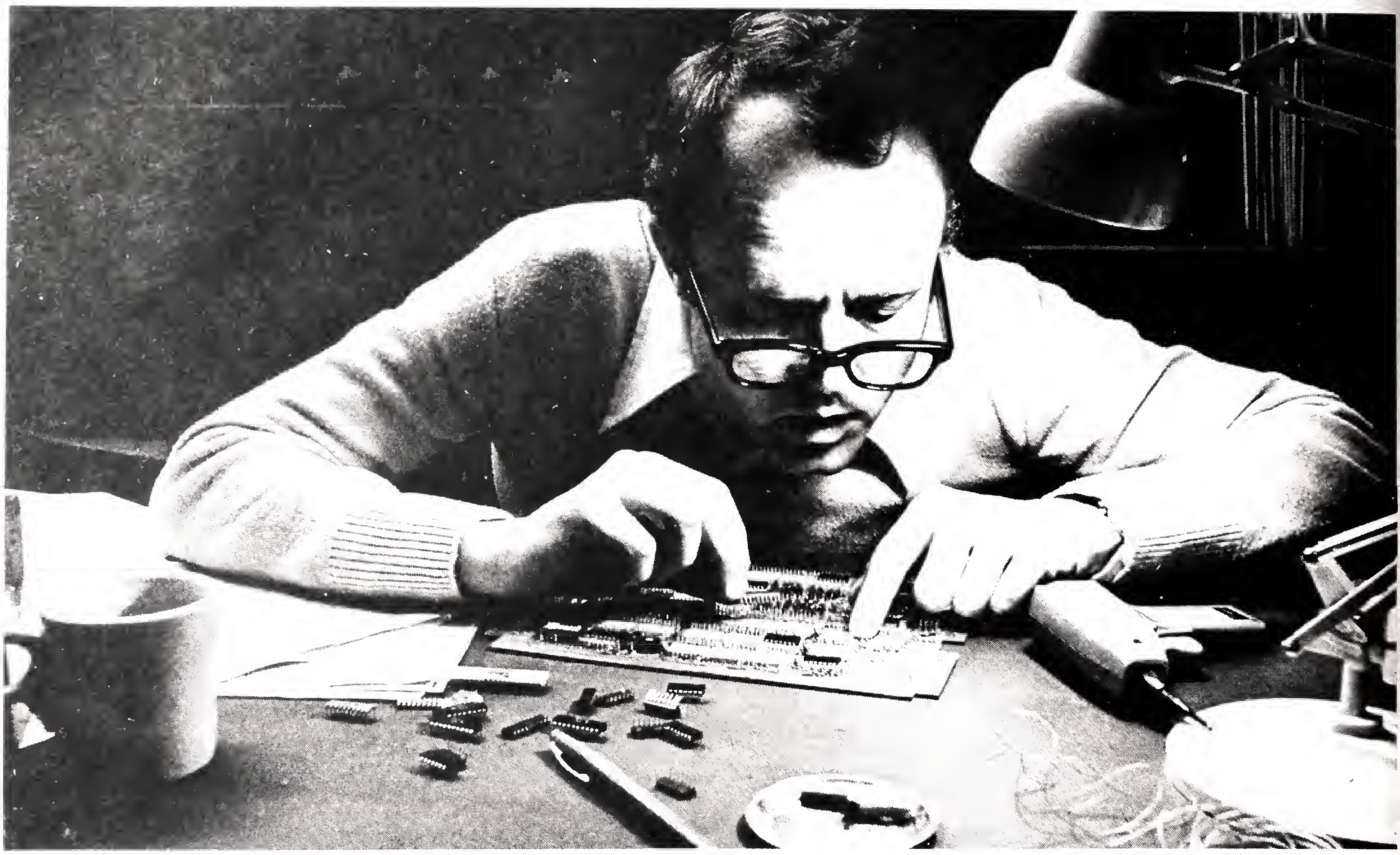

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